regarded as separate markets. Clearly, differences exist between dedicated Ethernet services such as WES, which run from an end-user's premises to a CP's point of handover, and LLU backhaul, which would start at a CP's co-location facility. These differences suggest that LLU backhaul links are not demand-side substitutes for AISBO because they do not include a local end. Similarly, a WES service is not a demand-side substitute for LLU backhaul links because it offers a local end that is not needed and that still has to be paid for (and this is a reasonably significant cost component for a WES service). Therefore, demand-side substitution between a WES product and a wholesale input used for LLU backhaul from a CP's co-location facility would be unlikely.

LLU backhaul faces different competitive conditions

5.84 Some respondents also argued that the competitive conditions were significantly different between LLU backhaul and other AISBO markets.

5.85 We believe that there is likely to be significant similarity of competitive conditions in the supply of Ethernet-based LLU backhaul links and AISBO. The similarity arises because the same technology is involved in providing transparent transmission technology between an operator's POC and a point in the local access network. This similarity means that the same type of entry barriers and economies of scale and scope are faced, especially those relating to digging and ducting.

5.86 In addition, the available evidence suggests that competitive conditions do not differ significantly between LLU backhaul and other low bandwidth AISBO services. For example, our information is that competitive provision of LLU backhaul (i.e. other than using BT's network) amounts to no more than 20% of the total. We estimate that BT's share of the low bandwidth AISBO market was around 73% as of December 2006. The similarity of market shares, together with similarity of entry and cost conditions, suggests that the competitive conditions between LLU backhaul and other AISBO markets are similar.

5.87 We therefore conclude that the AISBO market includes LLU backhaul demand.

RBS backhaul

5.88 Respondents that commented supported the inclusion of RBS backhaul within the TISBO market and we therefore conclude that this definition is appropriate. The issues that we consider below relate to the possible use of Ethernet for mobile network connectivity and the inclusion of radio links.

Ethernet backhaul

5.89 Some MNOs have highlighted to us that they will have a continuing requirement for TI services, but might also begin purchasing Ethernet backhaul as well. The precise timing and magnitude of MNOs' demand for Ethernet backhaul is unknown. But, in the absence of further information, we think that Ethernet-based RBS backhaul is likely to bear the same relation to other Ethernet services as (TI) RBS backhaul does to PPCs. As such any requirement for Ethernet-based backhaul would be likely to fall within the appropriate AISBO market.

Radio links

5.90 In the January 2008 consultation, we examined microwave connectivity (which MNOs either purchase from third parties or self-supply). We considered whether this

connectivity was potentially being used as an alternative to TISBO services. Our proposal was to include radio links in the TISBO market.

5.91 We note MNOs' comments regarding the ability to switch easily from a TISBO due to high initial capital costs and the comments from some MNOs that this service often has a limited availability or range. But where they are available (and suitable) they do impose a degree of competitive constraint on TISBO services. For example, when MNOs construct their networks using wholesale inputs there is a choice of using microwave links in certain localities.

5.92 Respondents raised a range of issues that suggested that the evidence on the inclusion of microwave links is potentially not as clear cut as we suggested in our January 2008 consultation. But in formulating our views in the January 2008 consultation, we held discussions with microwave providers, such as MLL, which suggested that it seeks to compete for niche parts of the leased lines market where these services operate most effectively. In addition, microwave, copper and fibre are all underlying inputs which are upstream of the wholesale markets we are assessing. We have taken the approach in this market review that it is the underlying demand for the characteristics of the product which informs market definition rather than the technology used. In some cases, it is therefore possible to switch between TISBO services provided using different technologies.

5.93 We discuss in our market power assessment the effect that the inclusion of microwave RBS links would have on BT's market shares. The analysis there suggests that it is not crucial to our finding of SMP to conclude on whether or not microwave links should be included in the TISBO market. However, for the purpose of ensuring we have appropriately assessed market power and that we have assessed all possible competitive constraints, we have included them in our market definition. But as we discuss later in Section 7, the possible limitations on the use of radio links suggest that there are limits to the competitive constraint that this form of connectivity might impose. We have also taken this into account in our market power assessment.

5.94 We have therefore concluded that it is appropriate to include RBS backhaul within the TISBO market. To the extent that MNOs use radio links to provide backhaul, these have also been included in our market power assessment.

Ethernet in the First Mile

5.95 Some respondents pointed to Ethernet over copper / Ethernet in the first mile services (EFM) as providing a competitive constraint on leased lines (potentially both AISBO and TISBO). Therefore, we have considered the implication of EFM services for our wholesale AISBO and TISBO definitions.

5.96 At the retail level, EFM is used to deliver Ethernet at low bandwidth to businesses with similar functionality to low bandwidth Ethernet leased lines. As such it cannot be considered as a separate emerging market from the current low bandwidth retail AI market, but rather is a different way of providing a retail AI service.

5.97 The wholesale inputs used to deliver an EFM-based retail Ethernet service are based on multiple copper pairs (bonded copper) access lines. Copper access lines are available to all CPs due to the requirement on BT to provide unbundled local loops at cost-oriented price (which is a remedy arising from BT's SMP in the wholesale local access market).

5.98 The only real difference between EFM-based retail Ethernet and other low bandwidth AI services is the use of copper in the access segment (and corresponding lower costs of using existing copper access rather than new fibre). This is similar to the TI markets, where copper is typically used at lower bandwidths (below 2Mbit/s) and fibre at 2Mbit/s and above. And as noted earlier, we do not believe it would be appropriate to define separate markets on the basis of whether the service is provided over fibre or copper.

5.99 Therefore, in the same way as we have not identified an explicit distinction between TISBO services provided over copper and similar TISBO services provided over fibre, we do not propose to distinguish EFM from other AISBO services. The implications of EFM are discussed further in Section 8 which sets out the regulatory obligations which Ofcom intends to place on BT in markets where it has SMP.

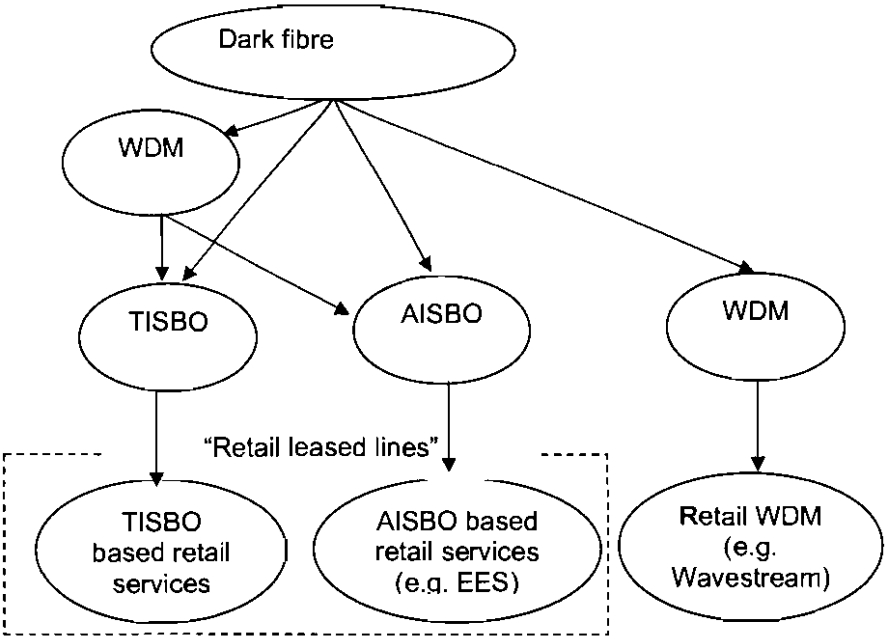
Wave Division Multiplexing

5.100 Some respondents were concerned that we did not find WDM in the same market as other wholesale leased lines services.

5.101 As discussed in Section 3, we have concluded that it is not appropriate to include WDM in retail AI or TI markets. This is based on the specialised nature of this service, in particular its ability to offer highly scalable and flexible bandwidth. Given this finding at the retail level, we have not reviewed the use of WDM as an input into retail WDM services in our wholesale market assessment.

5.102 This does not mean however that we have ignored wholesale services that use WDM as an upstream input. WDM is a highly efficient transmission technology that is used to support the backhaul element of AISBO and TISBO services and core links. But as we stated in our 2003/04 Review, the WDM element of the service is an upstream characteristic of the wholesale AISBO/TISBO products described above. It can be used as an input into different products that are in distinct (downstream) economic markets as shown in the figure below.

Figure 5.1: Relationship between wholesale leased lines and upstream inputs



5.103 As such, we have not treated WDM as a separate wholesale leased line product market as it is upstream of the markets considered by this market review. It also falls outside the scope of the European Commission's list of recommended markets.

5.104 Related to this point, one respondent suggested that if we were to consider a dark fibre market review, it would be relevant to consider WDM access at the same time. We discuss the issues regarding a possible dark fibre market review at the end of Section 8. The relevance of this comment is that it supports the view above that services such as WDM are upstream of the leased lines markets.

5.105 Our conclusion is therefore that WDM falls outside the scope of the wholesale services relevant to AISBO and TISBO markets.

Backhaul to the cabinet

5.106 As we stated in the January 2008 consultation, LLU backhaul – which we have concluded above should fall within the AISBO market – connects a CP's co-location facility to its relevant point of handover. Presently most CPs have their co-location equipment at BT local exchanges. However, our LLU backhaul definition would include co-location at a point closer to the end-user, including at the street cabinet level. Similarly, the definition could include co-location at a point more distant from the end-user.

4. Separate wholesale trunk market

5.107 Most CPs that commented on this issue supported the definition of the trunk market, and its boundary with TISBO markets, using the concept of aggregation nodes as Ofcom had proposed. Two other CPs generally supported the proposal though they thought that there was a need to assess the potential impact of the re-classification of some trunk circuits as terminating segments.

5.108 One CP requested clarity in respect of how the market definition would actually work. In particular, it wanted to understand how circuits between Tier 1 nodes would be either classified as trunk or terminating segments. Some CPs also requested further clarity in respect of where the precise boundary between AISBO and any corresponding trunk market would sit

5.109 BT did not believe that the links between Tier 1 nodes within main urban/business areas e.g. London should always be deemed as "origination". BT highlighted that in such areas, the aggregation opportunities are themselves very large and infrastructure competition has been established. In these circumstances, BT should not have any obligations to provide connectivity.

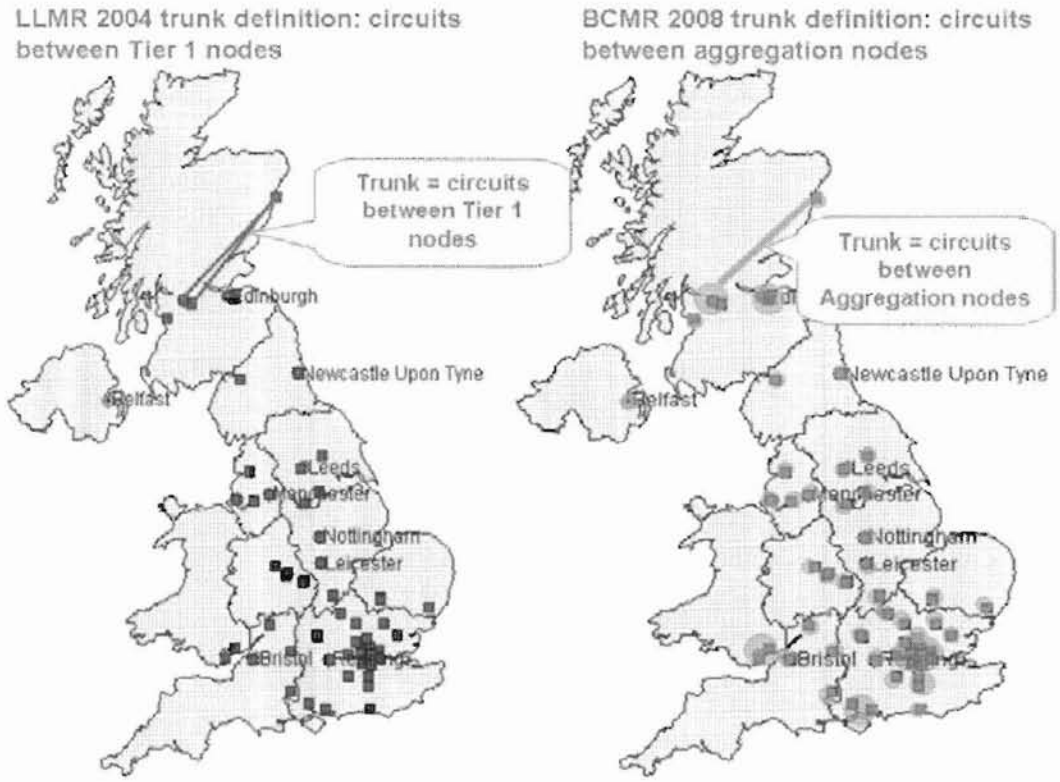
Ofcom's response

5.110 One CP requested further clarity on our revised SDH/PDH trunk definition, which, in the January 2008 consultation we defined trunk as circuits between aggregation nodes. We have set out below a further description of what the revised proposals mean in terms of the classification of circuits as either trunk or terminating segments. We then assess CPs and BT's concerns over the possible impact of the revised proposals. Finally, we discuss CPs' request for further clarity over the AISBO market definition.

Clarification of trunk market definition

5.111 In the 2003/04 Review, we defined trunk circuits as those between any of BT's Tier 1 nodes (or the relevant equivalent on OCPs' networks). In Figure 5.2 below, we show the location of BT's Tier 1 nodes on the left-hand map. Based on the 2003/04 Review trunk definition (i.e. circuits between Tier 1 nodes), we also show two possible trunk routes. Because there are two Tier 1 nodes serving Glasgow (the "Glasgow" Tier 1 node and the "Clyde" Tier 1 node) and a Tier 1 node in Aberdeen, we show two possible trunk routes, one from Aberdeen to the Glasgow node and another from Aberdeen to the Clyde node.

Figure 5.2: Network map showing BT's Tier 1 nodes



Source: Ofcom, November 2008

5.112 In the January 2008 consultation, we proposed to narrow the scope of the trunk definition by defining trunk circuits as those between a smaller number of so-called "aggregation nodes". We identified 40 such aggregation nodes, which are shown in the right-hand side of Figure 5.2 above.

5.113 As part of these proposals, each of BT's Tier 1 nodes was mapped to one of these aggregation nodes. In effect, we grouped together Tier 1 nodes serving the same urban centre (so for example Glasgow and Clyde Tier 1 nodes fell within a single Glasgow aggregation node). As explained above, the aggregation nodes concept was intended to reflect the fact that CPs have built their core/trunk networks to serve major population centres/business districts. These aggregation nodes represent those areas where CPs have sufficient aggregation opportunities to make it worthwhile to locate key interconnect points.

5.114 Under the proposed market definition, only circuits between aggregation nodes would be classified as trunk. Hence, in our example, there would now be a single trunk route linking Aberdeen to the Glasgow area (as shown in Figure 5.2 above).

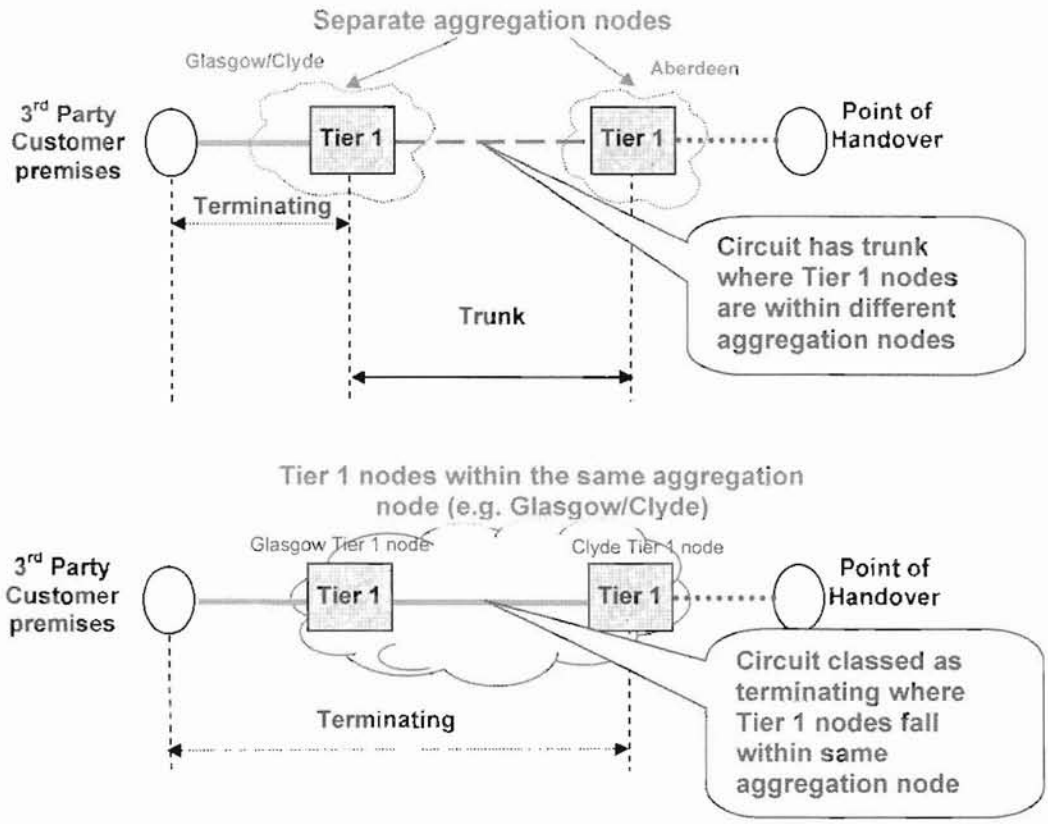
Implications of the revised trunk definition for circuits between Tier 1 nodes

5.115 On BT's network, a trunk circuit will still always connect two different Tier 1 nodes.[35] But unlike our previous definition, some circuits linking Tier 1 nodes will not be

[35] This would be based on BT's existing logical routing model. Each postcode in the UK is parented to a particular Tier 1 node. And therefore each Tier 1 node has a catchment area associated with it (consisting of all postal sectors parented to that note). Therefore, if BT sells a wholesale circuit spanning two catchment areas, the circuit

classed as trunk. The additional condition for a circuit to be regarded as a trunk circuit is that the Tier 1 nodes through which the circuit passes should be in separate aggregation nodes. If the circuit passes through different Tier 1 nodes but they are in the same aggregation node, this circuit would be classed as a terminating segment. We show this diagrammatically in Figure 5.3 below.

Figure 5.3: Description of revised trunk market definition



is deemed to be routed via the respective parent Tier 1 nodes each postal sector is parented to. On the other hand, circuits within the same catchment area would be parented to the same Tier 1 node and therefore the logical routing of that circuit would not be deemed to contain a segment between different Tier 1 nodes.

Source: Ofcom, November 2008

5.116 The revised definition of trunk means that we would now class any BT circuit between Tier 1 nodes that fall within the same aggregation node as a terminating segment. The lower part of the above figure shows two Tier 1 nodes falling in the same aggregation node. For example, we identified in the January 2008 consultation a Glasgow aggregation node, which would capture two of BT's Tier 1 nodes: the "Glasgow" and "Clyde" Tier 1 nodes. Figure 5.3 above shows that we would now classify a circuit between these two Tier 1 nodes as a terminating segment.

5.117 Therefore, if a CP wanted to supply an end-user served by BT's Glasgow Tier 1 node and the CP's Point of Handover (POH) was at the Clyde node, the circuit from the end-user to the POH would no longer contain a trunk element. Instead, we would now class the circuit as a terminating segment from the end-user to its Point of Handover. Previously, this circuit would have included a terminating segment from the end user to the nearest Tier 1 node (i.e. "Glasgow) and a trunk segment from the Glasgow Tier 1 node to the Clyde Tier 1 node at which the CP is interconnected.

5.118 In Annex 7 we list the final set of aggregation nodes (based on our conclusions in Section 6) and show how each of BT's Tier 1 nodes maps onto one of these aggregation nodes. Hence, if a CP purchases a circuit and part of that circuit is between Tier 1 nodes, it will be possible to assess whether these Tier 1 nodes fall within the same aggregation node or in separate aggregation nodes and therefore whether that circuit would continue to be classified containing a trunk element.

Concerns over trunk definition on market power assessment and regulatory remedies

5.119 Respondents' main comment on the substance of our proposed revised trunk definition concerned the impact on their existing circuits of the potential re-classification of trunk and terminating segments. We think that any impact assessment is more relevant to our remedies stage. For example, in our assessment of remedies it is appropriate to take account of the potential impact of our proposed product market definition on existing and prospective wholesale customers (including their purchases of BT's PPCs). But the key question in the first instance is whether we think that we have identified the correct boundary between terminating and trunk markets for the purpose of assessing competitive conditions in relevant markets.

5.120 As we explained in our January 2008 consultation, we think that the boundary that we have identified between aggregation nodes is appropriate. The consolidated list of "aggregation nodes" reflects where the main CPs have rolled-out their network. There is limited prospect for them to interconnect at all Tier 1 nodes given the economies of scale available to CPs at those locations. It is therefore more likely to be reflective of the location of key bottlenecks and better captures the likely difference in competitive conditions between trunk and terminating markets. Hence, we think our market definition approach is more appropriate for assessing SMP in trunk and terminating segments.

5.121 BT did not believe that we should class all of the links between aggregation nodes in main urban/business areas as "origination" (SBO). This comment appears to stem from two main concerns: first, that there may be more than one "aggregation node" within a particular urban area; and second that we should avoid a definition of trunk and TISBO that always identified the origination element as a bottleneck (i.e. with limited prospect for sustainable competition).

5.122 In relation to the first of these concerns, we note that in the January 2008 consultation we identified only one aggregation node for the London area. Based on

BT's concerns we have considered later in Section 6 whether it is appropriate to identify more than one "aggregation node" for the London area.

5.123 On the second point, even if we were to identify all circuits within London as origination, we agree that this should not rule out the possibility that certain TISBO markets could be found to be competitive (in some geographic areas or at some bandwidths). Indeed, in the January and July 2008 consultations, our geographic market assessment proposed to find a competitive local market for the high bandwidth and very high bandwidth 155 Mbit/s TISBO services within the London area. Therefore, we do not necessarily see that the identification of separate trunk and SBO markets means that we will not find some variations in competitive conditions in some parts of the latter markets.

Defining the scope of the AISBO markets

5.124 We note that some CPs have also requested further clarity in respect of where the precise boundary between AISBO and any corresponding trunk market would sit. Strictly speaking, it was not necessary to provide a definitive conclusion for the purposes of market definition and our subsequent SMP assessment. This is because BT does not currently provide any AI trunk circuits. Going forward, we also considered that the precise timing of the development of core connectivity for AI markets remained highly uncertain. Hence, for the purpose of the market definition and market share analysis, in the January 2008 consultation, we did not seek to define an explicit boundary between AISBO and AI trunk markets.

5.125 However, having found SMP on low bandwidth AISBO services, we are seeking to impose regulatory remedies on those services. We therefore still need to clarify the precise scope of BT's AISBO obligations. Some AI trunk products could emerge in the timeframe of the review (although this is by no means certain), so the AISBO market needs to be defined in a way that makes the boundary clear between regulated (terminating segments) and unregulated markets.

5.126 We think that we could best frame these obligations in terms of where the AISBO obligation ends (which, by definition would also highlight where a trunk service would begin). As with the assessment of TISBO and SDH trunk markets, this analysis has an inherent geographic element, so we have included our discussion of this issue in Section 6.

Conclusions

5.127 In summary in the case of both the AISBO and TISBO markets, we think that the relevant basis for identifying the break between trunk and terminating segments should not rely solely on the location of BT's choice of network nodes (i.e. its Tier 1 or metronodes). In both cases, we think that the "aggregation nodes" concept provides a more appropriate basis for identifying the break. We therefore discuss in Section 6 our final proposals in respect of aggregation nodes for the TISBO and SDH/PDH trunk market and, on a similar basis, the proposed scope of the AISBO market.

5. Trunk versus alternative forms of conveyance

5.128 There were no comments in this area.

Ofcom's response

5.129 As no respondents provided further evidence, in response to the January and July 2008 consultations, to support an alternative trunk definition, we have concluded that it is appropriate to define a market for SDH/PDH trunk services, distinct from other forms of conveyance services. As stated in our January 2008 consultation, this is based on a range of factors:

- **Technical barriers:** we consider that technical features of TDM-based transmission suggests that OCPs could not easily switch to alternative NGN/conveyance networks as a substitute even where they have spare capacity present. Indeed, going forward, BT will continue to support a product on its 21CN, which offers "native" TDM services suggesting distinct demand for this form of network connectivity that a number of retail customers will continue to value.

- **Other barriers to switching:** there are still various issues with interconnection that create further barriers to switching (for example, different interconnection locations may exist for different technologies; requirements for additional interconnection equipment to support SDH transmission). As such, if a hypothetical monopolist were to impose a SSNIP on trunk segments, it is unlikely that sufficient switching would occur to yield that SSNIP unprofitable.

- **Evidence on OCPs' use of core capacity:** The way in which OCPs are currently able to use their own core networks does not suggest that it is easily substitutable for SDH/PDH trunk. As we discuss under the SMP assessment in Section [x], while OCPs may have core network capacity, our assessment of BT's shares of trunk routes suggests that OCPs are not using these networks to provide SDH/PDH trunk to the extent that might be expected by the network presence of some OCPs.

- **Lack of indirect constraints:** as TI services reliant on SDH/PDH trunk are in a separate market to other retail business connectivity services we consider indirect constraints would not be applicable.

Conclusions

5.130 Based on the above assessment, as discussed in more detail in paragraphs 5.133-5.188 of the January 2008 consultation, we therefore conclude that it is appropriate to define separate markets for SDH/PDH-trunk and broadband conveyance.

6. Bandwidth breaks

5.131 Some CPs were concerned that we had conducted limited analysis of the way in which retail bandwidth breaks might map onto wholesale markets. One respondent suggested that there was no assessment of whether the wholesale competitive conditions reflect the breaks we proposed at the retail level.

TISBO bandwidth breaks

5.132 BT agreed with our proposed TISBO market breaks in our January 2008 consultation but did not agree with the proposed identification of an additional break in the market between 155 Mbit/s circuits and 622 Mbit/s circuits in our July 2008 consultation. It questioned whether the distinction between retail leased lines bandwidth markets would necessarily read across to wholesale bandwidths and argued that competitive

conditions in the provision of 155 Mbit/s and 622 Mbit/s TISBO were similar. It also questioned the wholesale market share data we used to determine that competitive conditions varied between the very high bandwidth markets.

5.133 A number of other CPs and MNOs agreed that a break in the markets for very high bandwidth TISBO services exists. They argued that they were still reliant on BT for 155 Mbit/s circuits in many parts of the country and therefore that competitive conditions varied relative to 622 Mbit/s.

5.134 Many CPs however expressed more general concerns in response to the January 2008 consultation over the use of wholesale pricing/cost data to inform market definition. Two respondents argued that the differences between wholesale and retail demand characteristics might suggest different bandwidth splits.

AISBO bandwidth breaks

5.135 Two respondents agreed with the proposed identification of a high bandwidth AISBO market. Seven respondents to the January 2008 consultation did not agree that there is a separate market for circuits in excess of 1Gbit/s. Two of those made similar comments in their response to the July 2008 consultation. In summary, there was a range of factors that CPs identified, which they suggested would not support a separate high bandwidth AISBO market. Most of these are discussed above in Section 3 as they are also relevant to retail market definition. However, they are set out again below for ease of reference and completeness:

i) **Supply-side synergies**: both low and high bandwidth AISBO services will employ the same fibre. As fibre represents circa 60% of the costs base for circuits in excess of 1 Gbit/s, BT would be able to leverage these synergies between the two markets. One CP highlighted, for example, that if a Hypothetical Monopolist tried to impose a price increase in the low bandwidth market, suppliers of high bandwidths would be able to enter the market using existing fibre assets;

ii) **Costs of different bandwidths**: some CPs noted that the analysis was based on current BT cost data, however, equipment prices that drive the differences in bandwidth costs are expected to fall faster than the cost of ducting and fibre. This will increase the level of demand-side substitution;

iii) **BT's ability to price services well above costs**: the fact that cost differences are much smaller than price differences for different bandwidth AISBO services suggests that BT can apply value-based pricing. This suggests that all circuits are in the same market;

iv) **Size of high bandwidth AISBO market**: some CPs argued that the size of the high bandwidth market did not warrant a separate market as the consumption of circuits in excess of 1 Gbit/s has not yet increased to a significant level. Some CPs also suggested that the size of the market is small (possibly to the degree of being statistically insignificant) and therefore circuit sales would not be a good indicator of future competitive conditions;

v) **Competitive conditions becoming more homogenous**: some CPs argued that the current view of competitive condition was not sufficiently forward looking. Some CPs highlighted that there is likely to be significant growth in demand for circuits above 1 Gbit/s services, including from LLU backhaul operators. As the

market demand develops outside of London, BT will be able to leverage market power between different bandwidths as it will have greater fibre coverage; and

vi) **Development of ORCHID-based platform**: some CPs highlighted that BT's deployment of its ORCHID platform would erode differences between different bandwidths. One respondent referred to the January 2008 consultation, where we stated that "the incremental costs of providing additional bandwidth [over the ORCHID platform] will not vary significantly". Given this uncertainty, CPs highlighted that it would be the wrong time to change the market definition.

Trunk

5.136 Only BT commented on the proposal to define a single trunk market including all bandwidths. It suggested this would lead to a counter-intuitive outcome in terms of possible remedies. BT referred to a CP purchasing, for instance, a PPC requiring a trunk element from BT. BT argued that at certain bandwidths (i.e. at 622 Mbit/s) a terminating segment could be free from regulation but 622 Mbit/s trunk segments would still be priced on regulated terms. And if alternative providers could supply the terminating segments competitively then CPs should be able to provision the trunk segment competitively. BT therefore suggested a break in the market reflecting variations in competitive conditions for trunk.

Ofcom's response

5.137 Respondents to our two consultation documents made a number of points related to the identification of markets according to bandwidth. The main points were as follows:

i) Some OCPs were concerned that we did not provide sufficient evidence to justify the use of the bandwidth breaks seen in retail markets to inform the bandwidth breaks for AISBO and TISBO markets;

ii) In response to the January consultative document, a number of CPs disagreed with our proposal to define a single very high bandwidth TISBO market including circuits at all bandwidths over 45Mbit/s. CPs generally supported the revised proposals, set out in our July 2008 consultation document, to identify separate markets for very high bandwidth TISBO circuits at bandwidths up to and including 155Mbit/s and at bandwidths over 155Mbit/s. By contrast, BT supported the identification of a single very high bandwidth TISBO market (including 155Mbit/s and 622Mbit/s) at the wholesale level;

iii) Some CPs were also concerned about the identification of a separate high bandwidth market for AISBO, arguing that a single market should be defined for AISBO circuits at all bandwidths;

iv) BT considered that it was appropriate to identify a separate market for trunk circuits for higher bandwidths.

5.138 We consider the bandwidth issues for symmetric broadband origination markets and trunk in turn below.

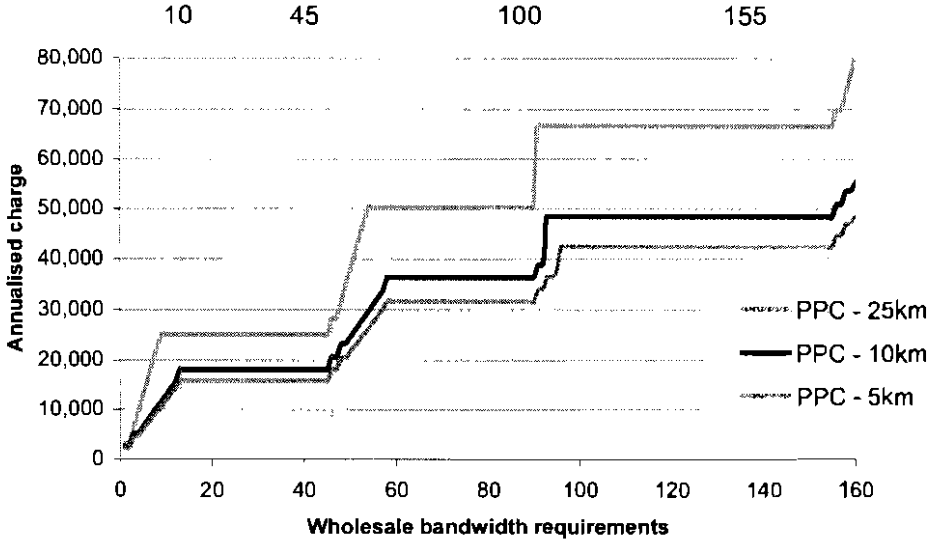
Mapping retail bandwidth breaks onto AISBO and TISBO markets

5.139 We explain our reasons for reflecting retail market definition in our definition of wholesale market above, in paragraph 5.3. However, in light of the comments

received on this issue, we re-assessed our proposals for TISBO markets in our July 2008 consultation. In particular, we updated and modified the retail pricing analysis presented in the January 2008 consultation[36].

5.140 As described above, our approach to identifying bandwidth breaks is based on identifying the combination of circuits of various bandwidths that would provide the cheapest way of delivering a particular total bandwidth requirement. The key difference in the revised analysis is that it is based only on a consideration of TISBO charges, that is, we have excluded any trunk circuit costs which had been included in the earlier analysis of retail circuits (for which end-to-end costs are relevant[37]). The results of the updated analysis are shown in Figure 5.4 below.

Figure 5.4: Comparison of Wholesale input prices



Source: Ofcom, July 2008

5.141 The figure shows for different distance circuits (from 5km to 25km) the service based price (rental plus annualised connection charge) of providing a particular bandwidth requirements. The horizontal segments indicate where the cheapest way of obtaining the desired bandwidth is by purchasing a single circuit of a higher bandwidth, whilst the upward-sloping parts show where multiples of lower bandwidth circuits are cheaper. For example, a communication provider requiring bandwidth of between about 15Mbit/s and 45 Mbit/s would generally find it economic to use a 34/45 Mbit/s circuit rather than multiple 2Mbit/s circuits.

5.142 The updated analysis confirms the existence of a bandwidth break between 34/45 and 155 Mbit/s TISBO. This is because there are relatively large, near vertical "steps" between the different bandwidths, rather than a smooth curve. These indicate that the range of customer bandwidth requirements over which a customer might switch

[36] page 83 figure 15.

[37] For purpose of retail market definition, it is clearly relevant to include all wholesale inputs that go into providing that service, taking account of how these costs might vary by bandwidth. Hence, to supply a retail customer we need to understand the likely costs of trunk and terminating segments that would be used to link the retail customer's sites.

between circuits of different bandwidths in response to a SSNIP is relatively limited. The figure suggests that it would generally be most efficient to seek to use a 155 Mbit/s circuit to serve bandwidth demand above 100 Mbit/s. Similarly, 34/45 (or multiples thereof) is only efficient just below 100 Mbit/s.

5.143 The above analysis therefore confirms that the breaks that we identified from our analysis of retail markets are also found in wholesale TISBO markets. Break points are identified at bandwidths of 2; 34/45 and 155 Mbit/s. The fact this supports the analysis based on retail circuits is to be expected since trunk costs, which are excluded from the revised analysis, show less variation with bandwidth than TISBO costs.

5.144 We were not able to compare the price of 155 Mbit/s versus 622 Mbit/s in the above figure. This is because BT does not publish wholesale prices for 622 Mbit/s circuits. But generally, it appears that retail market definitions map quite well onto our wholesale definitions.

AISBO markets

5.145 The price analysis used to support our assessment of bandwidth breaks in retail AI markets did not include any trunk costs (as retail AI circuits do not include trunk segments). It is therefore applicable to the wholesale AISBO market. Ofcom's reasons for identifying separate retail markets for high and low bandwidth circuits are set out in the Section 3. In this Section however we report the results of an updated analysis of costs by bandwidth.

5.146 We have repeated the analysis in Section 3, with the most up to date information on equipment cost differences. This confirms the analysis in our January 2008 consultation regarding the current relative differences in the prices of different bandwidth AISBO services. Our assessment also confirms that the current cost difference can be expected to hold for the time horizon of the review, that is, over the next 3-4 years.

5.147 However, we noted that given the relatively large element of costs which are common to circuits of different bandwidths, it was not entirely clear whether we could determine an appropriate "competitive price" benchmark for the relevant retail market bandwidths we were comparing since this would depend on the way BT chose to recover common costs. As discussed in paragraphs 3.339 to 3.341 of the January 2008 consultation, if the basis for considering market definition is a "competitive price" benchmark derived on the basis of cost allocation decisions, which are in turn based on an assessment of competitive conditions in that market then this becomes a rather circular process. Instead, it may be preferable (where common costs tend to dominate) to move directly to a consideration of homogeneity of competitive conditions across bandwidths.

5.148 We discuss below our analysis of variations in competitive conditions. We have presented this both for our AISBO and TISBO markets.

Analysis of variations in competitive conditions

5.149 Even where circuits of different bandwidths are not demand- or supply-side substitutes, we may still regard particular bandwidth circuits as being part of the same market if the competition conditions of the bandwidths being compared are sufficiently homogenous. We explain below that, taking account of the available price

and cost evidence as well as looking into the evidence of competitive conditions, we consider that we have appropriately identified relevant breaks in the market.

TISBO markets

5.150 Our assessment of competitive conditions in Section 7 lends support to the breaks we identified for TISBO markets. In particular, as discussed in our July 2008 consultation, the evidence suggests that competitive conditions in the supply of 155 Mbit/s (at least outside the Central and East Londoan Area (CELA)) and 622 Mbit/s lines differ significantly. One reason for this difference is that the revenue available from even a single 622 Mbit/s makes it more likely that it will be economic for a competing operator to supply a 622 Mbit/s circuit than a 155 Mbit/s circuit. The deterrent effect of sunk costs on potential entry is likely to be more significant in the latter market.

5.151 This is reflected in the further evidence that OCPs have provided on their limited ability to provide 155 Mbit/s circuits and the extent of self-supply on 622 Mbit/s circuits, and in market shares at the wholesale level. BT appears to have around 7% of 622 Mbit/s TISBO sales, but around 56% of 155 Mbit/s TISBO in the UK excluding the Hull area and the CELA. This result does not seem to be explained by 'small number' issues because significant quantities of both lines are supplied.

5.152 In respect of lower bandwidth markets, there is strong evidence that circuits up to and including 2Mbit/s face different competitive conditions to higher bandwidth markets. In particular, we estimate that BT has a very high share of the TISBO market (89%).

5.153 The only market where competitive conditions are potentially quite similar is in relation to 34/45 Mbit/s and 155 Mbit/s markets. Indeed, we found both markets were competitive in the CELA (BT having 20% and 17% shares at the different bandwidths) and uncompetitive in the rest of the UK (excluding the Hull area). However, our price and cost analysis does not support the inclusion of 155 Mbit/s in the same market as 34/45 Mbit/s. We have therefore concluded that a separate market exists for 34/45 Mbit/s and 155 Mbit/s.

AISBO markets

5.154 In respect of the AISBO market, the analysis of current competitive conditions tends to support our proposed finding of separate markets at low bandwidth and high bandwidths. Ofcom's calculations suggested that BT's share of the wholesale high bandwidth AISBO market was 26%, compared to 73% for low bandwidth AISBO, reflecting the much greater investment in competing infrastructures that has taken place in the high bandwidth market.

5.155 Some respondents expressed concern with the above market share data. In particular, given the fast pace of growth of the AISBO markets, they suggested that BT's shares in the high bandwidth AISBO market may have grown to an appreciable extent, such that the variations in competitive conditions between low and high bandwidth markets are not so clear. We have considered this issue in more detail in Section 3. In summary, our analysis of the available data suggests that we have not seen significant changes in BT's market shares and the significant variations in competitive conditions still exist. Whilst data revisions lead us to believe that BT's share of the high bandwidth AISBO market at December 2006 may have been higher than suggested in the January document, a more up-to-date analysis suggests that

BT's market share in fact fell between December 2006 and April 2008 to between 38% and 40%.

5.156 Some respondents also expressed concern that our market definition was reliant on an assessment of current competitive conditions and was not forward-looking. In particular, respondents suggested that, so far, most high bandwidth AISBO circuits were used to serve the London area. Demand is likely to increase for high bandwidth circuits, particularly in support of LLU backhaul. Outside of London, BT would be able to utilise its existing fibre assets but CPs without extensive networks outside London would be reliant on it for the provision wholesale circuits. Some respondents considered that developments such as the deployment of BT's ORCHID platform would serve to reinforce the economies of scale and scope. As such, it would not be economic for a CP to provision its own fibre, even for circuits of 2.5 or 10 Gbit/s.

5.157 We have considered this issue below and in Section 6, and in particular how likely it is that in the lifetime of this review a significant demand for circuits above 1 Gbit/s would appear outside major urban areas.

Forward looking assessment

5.158 In Section 3, we discussed a number of the above points as they also related to our retail market definitions. For example we discussed why we thought that the roll-out of BT's ORCHID platform would, if anything, make differences in the bandwidth gradient for AI services clearer. As this forward-looking retail assessment was based on the underlying wholesale input costs, we think that it is equally applicable to the AISBO market.

5.159 As discussed above, some respondents suggested that our assessment of competitive conditions might differ if we looked at this on a forward-looking basis. In particular, once the demand for circuits above 1 Gbit/s grows in areas outside London, where alternative infrastructures are less well developed, these operators argue that competitive conditions in the high bandwidth AI market will come to resemble those in the low bandwidth market. Our conclusion is that this is unlikely to happen, in the timeframe relevant to this review, for the following reasons:

- applications that require such high bandwidths tend to be concentrated in urban areas where large users such as financial institutions and government offices are located;
- demand for LLU backhaul in dense traffic areas is currently being met with circuits of speeds up to 1 Gbit/s, with investments for the forthcoming years now concentrating on 1 Gbit/s circuits. There does not seem to be a significant demand for LLU backhaul at higher bandwidths;
- demand for broadband in other areas, where the lower ability to exploit economies of scale makes LLU generally less attractive, is currently being met largely by use of bitstream access. This is unlikely to change in the near future.

5.160 The weight of evidence suggests that a significant cost differential is likely to remain between circuits at bandwidths up to 1Gbit/s and circuits at higher bandwidths. This is not likely to be affected by the implementation of BT's Project ORCHID. This suggests that customers are unlikely to be willing to switch between low and high bandwidth circuits in response to a SSNIP above the competitive price to an extent sufficient to render that SSNIP unprofitable. Moreover, competitive conditions in the

two markets appear to differ significantly (as indicated by both quantitative and qualitative factors) and appear likely to continue to do so.

5.161 In the light of this Ofcom believes that the market definitions set out in the January 2008 consultation remain appropriate. It therefore proposes to define a market for low bandwidth AISBO circuits including circuits of up to and including 1Gbit/s capacity and a market for high bandwidth AISBO circuits including circuits of over 1Gbit/s capacity.

Conclusions

5.162 In summary, we believe that we should apply the same bandwidth breaks at the wholesale level and at the retail level in both AISBO and TISBO markets, based on:

- the derived nature of wholesale demand;
- our analysis of prices and costs (revised to exclude wholesale trunk in the case of TI circuits); and
- our assessment of variations in competitive conditions between different bandwidth TISBO and AISBO services, which are likely to persist, at least for the timeframe of this review.

5.163 In summary, we have concluded the following bandwidth breaks apply for AISBO and TISBO services:

- TISBO segments at speeds up to and including 8Mbit/s;
- TISBO segments at speeds above 8Mbit/s and up to including 45 Mbit/s;
- TISBO segments at speeds above 45 Mbit/s and up to and including 155 Mbit/s;
- TISBO segments at speeds above 155 Mbit/s;
- AISBO segments at speeds up to and including 1Gbit/s; and
- AISBO segments at speeds above 1 Gbit/s.

Trunk bandwidth breaks

5.164 Ofcom does not consider it appropriate to define distinct markets for trunk segments at different bandwidths. This is because, unlike in TISBO markets, in which the bandwidth of the service is determined by the bandwidth of the relevant retail leased line, trunk segment traffic can be aggregated. A CP's trunk network will be made up of high capacity links even if the majority of circuits provided over those links address lower bandwidth retail markets (for example most trunk circuits are for 2Mbit/s or below). This means that the trunk services demonstrate significant economies of scope and scale.

5.165 In order to exploit these economies of scope and scale by aggregating traffic onto trunk networks, a CP will seek to design its trunk routes so that it can deliver services at any relevant bandwidth. Therefore, a CP is likely to be present at all bandwidths on a given trunk route and competitive conditions are likely to be similar for all bandwidths on that route. An operator with existing trunk capacity could easily switch from providing one bandwidth to another.

5.166 In its response to the January 2008 consultation, BT argued that it would not make sense to mandate it to provide a trunk circuits at all bandwidths if it were subject to competitive pressures for high-bandwidth terminating segments. However, we do not think it is appropriate to base our product market definition for trunk markets on the competitive conditions of terminating segments. On the demand side, as noted above, trunk and symmetric broadband origination are complements rather than substitutes. Supply-side substitution is unlikely, since a communications provider with an access network would still incur substantial sunk costs in order to build a distinct trunk network.

5.167 More generally, the economics of trunk and TISBO markets are rather different and the observation that, in some areas, TISBO markets at a particular bandwidth are competitive does not establish that trunk markets in different locations, and with different cost and demand conditions, are also competitive. Moreover, the extent of competition in TISBO is still quite limited and it is only in the CELA that TISBO markets at 155Mbit/s and below are effectively competitive.

5.168 We therefore conclude that it is not appropriate to identify separate trunk market at specific bandwidths.

Other issues: wholesale versus retail markets

5.169 One CP questioned the overall validity of separating retail and wholesale markets for leased lines. The CP noted that a leased line is simply a service that offers dedicated capacity between two locations. It argued that an operator may sell an identical service for the same price to both another operator and a business customer. Both will actually be using the circuit as an input to a final service, but only one then happens to sell this service to another customer. The CP argued that this perhaps suggests that there is only one market for leased lines rather than distinct retail and wholesale markets.

Ofcom's response

5.170 In relation to the concern that it is not appropriate to distinguish wholesale and retail markets for leased lines, we would first note that the Commission's Recommendation on Relevant Markets specifically refers to wholesale leased lines on its list of markets national regulators should review. Therefore, in taking utmost account of that Recommendation, we think that it is necessary to examine the appropriate distinction between retail and wholesale markets.

5.171 Whilst it is possible that some leased line suppliers may not draw a clear distinction in the terms they offer to large retail customers and to other operators, a clear distinction can be drawn between the products which BT provides to retail customers (that do not own network infrastructure) and their wholesale counterparts[38]. In order to use BT's wholesale PPC products a firm would have to invest in infrastructure of its own to combine with elements purchased from BT. However the tendency, if anything, is for large retail customers to outsource their requirements entirely and purchase a package of services as a "managed solution" rather than to invest in their own infrastructure.

[38] Although some MNOs have purchased circuits from BT on ostensibly retail "Netstream" tariffs in preference to wholesale RBS terms, we regard all MNOs' purchases as wholesale services.

5.172 A number of other respondents to our January 2008 consultation explicitly highlighted that the nature of retail demand, which often entails connecting low bandwidth circuits, is different to wholesale demand, which might entail demand for a large capacity backhaul link for example to extend the reach of an OCP's network to serve multiple downstream customers.

5.173 Indeed, in the January 2008 consultation, we sought to take explicit account of the need to distinguish between retail and wholesale services based on their intended use. For example, we treated Mobile Network Operators' purchases of retail leased lines circuits as wholesale purchases. MNOs combine these with their own network infrastructure to provide services to their retail mobile customers.

5.174 Therefore, in line with the Commission's Recommendation and the leased lines markets under review, we think that it is appropriate to consider both retail and wholesale markets.

Conclusions

5.175 In light of the above discussion, we concluded that the following wholesale product market definitions are appropriate.

Table 5.2: Revised wholesale product market definitions

Wholesale product markets	**Bandwidth breaks**			
TI symmetric broadband origination (TISBO)	**Low** Up to and including 8Mbit/s	**High** Above 8Mbit/s up to and including 45Mbit/s	**Very high - 155** Above 45 Mbit/s up to and including 155 Mbit/s	**very high - 622** Above 155 Mbit/s
Alternative interface symmetric broadband origination (AISBO)	**Low** Up to and including 1Gbit/s		**High** Above 1 Gbit/s	
Trunk segments (SDH/PDH)	All bandwidths			

Section 6

Wholesale geographic market definition

Introduction

6.1 In this Section, we first summarise the wholesale geographic market definitions set out in our January and July 2008 consultations. We then set out and respond to stakeholders' responses to these proposals before providing our conclusions with regard to the appropriate wholesale geographic market definitions for leased lines markets in the UK.

January 2008 proposals

6.2 In the January 2008 consultation we conducted a detailed geographic market analysis for each of the wholesale product markets defined (as summarised in Section 5 above).

6.3 Ofcom's analytical framework for defining the geographic scope of the relevant retail markets was explained in detail in Section 6 of the January 2008 consultation. This explained that there would be a separate geographic market for each of the relevant wholesale product markets in the Hull area. For the rest of the UK, Section 4 of the January 2008 consultation explained why, for leased lines markets, an analysis of demand-side and supply-side substitution will generally lead to the definition of very narrow geographic markets and thus is not informative of the geographic market definition for this review. In this light, Ofcom's analytical framework for the UK (excluding the Hull area) focussed on the presence of common pricing constraints and geographic variations in competitive conditions.

6.4 Ofcom's wholesale geographic analysis had four main elements:

- an analysis of wholesale service shares on a postal sector basis, using wholesale circuit information provided by operators;
- an analysis of network reach based on the number of alternative operators' networks within an economic build distance of each UK business site belonging to a business with over 250 employees, averaged by postal sector;
- consideration of BT's pricing policies, which can inform the extent to which there exists a common pricing constraint across geographic areas; and
- consideration of evidence on the degree of network interconnection between alternative network operators' networks.

6.5 Table 6.1 below summarises the proposed geographic market boundaries in the UK (excluding the Hull area) set out in the January 2008 consultation for each of the wholesale product markets considered.

Table 6.1: Summary of proposed wholesale geographic market definitions in the January 2008 consultation

Wholesale product market	Proposed geographic definition
Low bandwidth TI symmetric broadband origination	• The UK (excluding the Hull area); and • The Hull area
High bandwidth TI symmetric broadband origination	• The UK (excluding the Hull area and the CELA); • the CELA; and • the Hull area
Very high bandwidth TI symmetric broadband origination	• The UK (excluding the Hull area); and • The Hull area
Low bandwidth AI symmetric broadband origination	• The UK (excluding the Hull area); and • The Hull area
High bandwidth AI symmetric broadband origination	• The UK (excluding the Hull area); and • The Hull area
Wholesale trunk segments	• The UK

July 2008 proposals

6.6 In the July 2008 consultation in light of the responses to the January 2008 consultation we reviewed our methodology and the available evidence when defining the geographic scope of the revised proposed product markets. This led us to adjusting our analytical framework, including the revision of our assumed economic build distance from 250m to 200m.

6.7 In the July 2008 consultation document we assessed the geographic scope of the relevant markets for each of the two revised wholesale product markets; the very high bandwidth 155Mbit/s TISBO market and the very high bandwidth 622 Mbit/s TISBO market. The conclusion of this geographic analysis was that there exist a separate local geographic market in the London area for very high bandwidth 155 Mbit/s TISBO services, defined as the Central and East London Area (CELA) and the rest of the UK (excluding the Hull area). For the very high bandwidth 622 Mbit/s TISBO market we concluded that there is a national market, this being the UK (excluding the Hull area). Our proposed wholesale geographic market definitions from the July 2008 consultation are summarised in Table 6.2 below.

Table 6.2: Summary of proposed wholesale geographic market definitions in the July 2008 consultation

Wholesale product market	Proposed geographic definition
Very high bandwidth 155Mbit/s TI symmetric broadband origination	• The UK (excluding the Hull area and the CELA); • the CELA; and • the Hull area
Very high bandwidth 622Mbit/s TI symmetric broadband origination	• The UK (excluding the Hull area); and • The Hull area

6.8 The following sub Sections consider the issues raised by respondents to the two consultation documents for the relevant symmetric broadband origination markets. We then go on to consider the issues related to the market for wholesale trunk segments before summarising our conclusions.

Review of responses to the January and July 2008 consultation documents

6.9 In the January 2008 consultation, we asked the following question in relation to our wholesale geographic market definition proposals:

Question 6: Do stakeholders agree with our proposed wholesale geographic market definitions? In particular, do you agree with Ofcom that a separate market now exists in the UK for high bandwidth TISBOs in the Central and East London Area (CELA)?

6.10 In the July 2008 consultation, we asked the following question in relation to our wholesale geographic market definition proposals:

Question 3: Do you agree with our proposed wholesale geographic market definition for the wholesale very high bandwidth 155 Mbit/s TISBO market? In particular, do you agree with Ofcom that a separate geographic market exists in the UK for wholesale very high bandwidth 155 Mbit/s TISBO services in the Central and East London Area (CELA)?

6.11 We addressed a number of comments raised in response to the January 2008 consultation in the July 2008 consultation. For ease of reference, where relevant, these are repeated below.

Definition of local geographic markets

TISBO

6.12 BT argues that Ofcom has been over-cautious in its definition of geographic markets, believing that there is evidence to support local geographic markets in other product markets and in different geographic areas. In particular, BT argues that for the high bandwidth TISBO market separate local markets exist in Birmingham and Manchester as well as a further ten other locations where there exist multiple networks.

6.13 We disagree with BT that we have been over-cautious in our definition of local geographic markets. We have been considering the generality of this issue since 2005 when we collected data from operators which fed into our discussion document on disaggregated markets and in our review of the wholesale broadband access market which we concluded in May 2008. Our view in these reviews has been that where the available evidence suggests that local markets exist and such a conclusion can be robustly justified, then it would be appropriate to define local geographic markets. That said, where evidence was more suggestive of there being a national market, then it would be appropriate to define the geographic market as national in scope.

6.14 While we have continued to take this approach, we have however, developed our analytical framework to take account of comments received in response to our discussion document on disaggregated markets[39]. As set out in the January and July 2008 consultations, and summarised above, there are four main elements to our geographic analysis. We consider that it is important to take into account the available evidence of all of these elements when considering whether the scope of the geographic market for a particular product market is local or national.

6.15 In conducting this analysis we have reviewed the evidence throughout the whole of the UK, not only limited this to the London area. We produced data to this effect in Annex 7 of the January 2008 consultation. In light of the response from BT we revisited in the July 2008 consultation the question of whether there are separate local markets in parts of the UK in addition to the London area (Annex 6). The conclusion of that analysis is that while there is some evidence which could be used to support a conclusion of local geographic markets in other parts of the UK, it is our view that when the available evidence is considered in the whole, that a conclusion of local geographic markets in other areas cannot be robustly justified. It is our view that the weight of evidence more strongly suggests that these other geographic areas are part of a broader geographic market including the rest of the UK (excluding the Hull area) or the UK (excluding the CELA and the Hull area).

6.16 It remains the case, as highlighted in Annex 6 of the July 2008 consultation that the weight of evidence may not always suggest that these other geographic areas are part of a broader geographic market. We will continue to monitor market developments and the evolution of the competitive situation in order to assess whether different competitive conditions emerge in different geographic areas in the future.

AISBO

6.17 BT also argues that there exist local geographic markets in the provision of low bandwidth AISBO services and that Ofcom's analysis has not properly taken into account a forward-looking approach which would reveal the underlying potential for competition in the provision of low bandwidth AISBO services. BT further argues that the growth in LLU and associated self-provision of LLU backhaul by LLU operators indicates that there is local competition, which affects TISBO and AISBO markets.

6.18 We disagree with BT that there are local geographic markets in the low bandwidth AISBO market. While it is the case that there is some evidence which suggests that competitive conditions in the provision of these products do to an extent vary by

[39] "Disaggregated markets: leased lines", Ofcom, 28 March 2006. See http://www.ofcom.org.uk/consult/condocs/disagg/consultation.pdf

geographic location[40], we consider that the weight of evidence more strongly suggests that the geographic scope of the low bandwidth AISBO market is the UK (excluding the Hull area).This is for the same reasons set out in the January 2008 consultation:

- The analysis of service shares indicates that the geographic variation in competitive conditions is limited;
- While there is evidence of the potential for different competitive conditions in different geographic areas emanating from the presence of alternative operators as shown in our network reach analysis, this still appears to be a potential given the service share analysis above; and
- BT continues to price these services on a nationally uniform basis.

6.19 BT also criticises our approach for not being sufficiently forward-looking. We consider that we have taken as forward-looking an approach as it is possible to in this market given the changes that are taking place. Many TI circuits have recently or are being migrated to AI circuits, with this likely to continue as operators increasingly introduce 'next generation' networks. However, it is not clear how these changes will impact on competitive conditions in the market. One hypothesis is that competition will be come much more localised, with alternative operators concentrating their retail provision on their own network, in those geographic locations in which they currently have a network presence. An alternative hypothesis is that as BT rolls out its next generation network alternative operators will increasingly seek to benefit from the economies of scale that can be gained from using BT's network. There are also hypothesis which fall between these.

6.20 It is not at all clear which outcome will materialise and to speculatively conclude that the first of these scenarios will materialise and that local markets should be defined when there is no clear evidence that this will in fact be the case could risk significant consumer harm if markets were to be deregulated without sufficient competitive safeguards being in place. This is particularly so when the current available evidence does not support the finding of local geographic markets. Of course, should such an outcome materialise, we would need to review the market again to assess whether it was appropriate to remove regulation from certain geographic areas.

6.21 As to BT's argument regarding self provision of LLU backhaul by LLU operators we do not consider that this supports the finding of local geographic markets in the provision of low bandwidth AISBO services. We note in Section 5 that on a national basis, of total BES demand, only 20 percent is self-supply or provision from parties other than BT. This leaves 80 percent of BES provision being from BT. It could be that if all of this self-supply or alternative provision were to occur in the same geographic areas then it might be that there exist geographic differences in competitive conditions. However, from the data available to Ofcom, of this 20 percent, it is the case that there is very little geographic overlap of provision. Only two CPs self-provide or provide to third parties to any significant extent, with their customers being the same parties. Therefore, there is very little evidence of the self-provision of LLU backhaul circuits being such that it creates significant geographic variations in competitive conditions which would warrant the definition of local geographic markets. It is generally the case that LLU operators seek to purchase LLU backhaul from BT (on the basis of equivalence as determined by BT's

[40] For example the variation in local service shares illustrated in Figures 48 to 50 in the January 2008 consultation.

Undertakings) rather than choose to build their own capacity which could act as a competitive constraint on BT. A further point is that BT's reasoning implies separate backhaul and access markets. As explained in Section 5 we consider that the evidence suggests that there is a single market that includes access and backhaul. As such, BT's reasoning is not consistent with that evidence. That said, Ofcom recognises that there is the possibility that conditions of competition can change over the period of a market review and as such we intend to keep this market under review to ensure that the conclusions reached remain consistent with the evidence.

Pricing to inform market definition

6.22 BT argues (as it did on retail geographic market definition) that Ofcom is wrong to consider BT's pricing policies when defining geographic markets, citing a number of reasons why it has maintained national prices. These are that in the context of setting up Openreach it is not surprising that it has chosen to maintain a relatively simple pricing structure, the introduction of sub-national prices could have undermined trust with customers and further understanding of its costs on a geographic basis is required before it introduces local prices. BT goes on to state that it expects to introduce different pricing structures in the near term, which could include local geographic prices.

6.23 We disagree with BT that we are wrong to consider its pricing policies when defining the scope of geographic markets[41]. An operator's pricing can indicate the extent to which it considers conditions of competition are consistent across products or geographic areas. In addition, where national prices are set this can have the effect of transmitting competitive constraints in one geographic are to another geographic area – a common pricing constraint. Ofcom's approach is also consistent with that of the European Commission. For example, the European Commission earlier this year commented[42] on the Austrian NRA's (TKK[43]) decision to define a national geographic market in the provision of wholesale broadband access where this decision was made notwithstanding the comparatively stronger competitive dynamic in certain more densely populated areas identified by TKK. The European Commission considered that the evidence of Telecom Austria setting a nationally averaged price as being relevant to TKK's decision to define the market as national.

6.24 While we recognise that there may be other reasons why BT has continued to maintain a national price for a number of its services we continue to consider that the fact that it does is indicative of there being a national market. That said, it would not necessarily follow that if BT were to set local prices that the geographic market would then be found to be local in scope. Nor does it necessarily follow that where BT sets a national price that the market is necessarily national in scope.

[41] Ofcom notes that the European Commission, in its comments on Ofcom's wholesale broadband access market review, indicated that pricing information is relevant to the assessment of the homogeneity of competitive conditions. See http://circa.europa.eu/Public/irc/infso/ecctf/library?l=/uk/registeredsnotifications/uk20070733/uk-2007-0733_actepdf/_EN_1.0_&a=d page 11.

[42] http://circa.europa.eu/Public/irc/infso/ecctf/library?l=/sterreich/registeredsnotifications/at20080757/at-2008-0757_enpdf/_EN_1.0_&a=d

[43] TKK (Telekom-Control-Kommission)