## Question 1:When do you consider it would be timely and efficient for next generation access investment to take place in the UK?:

Currently there is no compelling business case for UK-wide deployment of next generation access networks.

It is useful to assess the UK in terms of three key levels of bandwidth to understand where we are today and where we might be in the medium (2 to 3 years) to long term (5 to 10 years).

(a) Basic Broadband ? whilst broadband has in recent years been defined as a bandwidth of 384 kbps or greater, it is reasonable today to define a minimum acceptable level of broadband as 2mbps (sufficient to support fast internet browsing, to view standard definition video streams and to download standard definition movies overnight). Currently 96% (see note 1) of addresses are able to receive 2mbps via affordable mass market solutions. A large proportion of the remaining 4% are being addressed by local broadband initiatives (community broadband initiatives as well as local / regional government initiatives)

(b) Current Generation Broadband ? an increasing number of end-users have more sophisticated requirements than can be met by a 2mbps connection (they want to download large files quickly (home workers, students), play games on-line, download HDTV movies), for these a connection speed of 8mbps or greater is required. Currently 89% (see note 1) of addresses have the potential to receive 8mbps or greater.

(c) Entry Level Next Generation Broadband ? there seems to be some consensus that the basic level of broadband required to support next generation applications is around 20 to 25 mbps (sufficient to support multiple application usage (incl. multiple users watching high quality TV), fast HDTV download, technology convergence and emerging applications such as telehealth). Currently 74% (see note 1) of addresses have the potential to receive bandwidth between 20 and 25 mbps.

Whilst there is no longer a digital divide issue with (a) (with some exceptions including 73 local authorities out of 408 in the UK which have 10% or more addresses within them unable to receive at least 2 mbps via xDSL or cable modem), there is a digital divide issue with (c) and to a lesser extent (b). In terms of (c) the theoretical 74% availability figure will require significant work from public sector bodies and other interest groups, along similar lines to that required for the original ADSL roll-out, to ensure the UK wide roll-out of ADSL2+ and ADSL Max). As a result the 26% shortfall, which is still significant in itself (see response to question 5 which explored the geographic distribution of the shortfall) is likely to be much higher in the short to medium term and will need to be closely monitored.

However, as things stand today, the vast majority of addresses are adequately supported by the bandwidth they are able to receive. They are not testing the limits of their broadband connections; this is evidenced by the fact that most users are unaware of the issues such as contention and distance from exchange influencing the actual bandwidth available to them.

The vast majority of users that do already have more sophisticated requirements greater than 8mbps are businesses able to pay for the specialist solutions (leased lines / FTTB) available from BT and the specialist business telecoms providers.

The key reason why there is no mass market demand for bandwidth of 20mbps or greater is a lack of next generation applications. As discussed in detail in the various OFCOM consultation documents and throughout the industry, without the demand it is too risky to invest in FTTC or FTTB. Yet, until these new applications become available and are widely understood, there will be no demand.

Therefore, my recommendation is, for the short to medium term, to focus on ADSL2+, ADSL Max and cable modem. Once sufficient critical mass in terms of number of addresses able to receive these higher bandwidths is achieved, next generation applications will be developed and rolled-out. Over time as take-up of these applications increases the bandwidth requirements of the average UK address will start to push towards the limit of this medium-term solution.

Whilst for a number of reasons we may be behind other countries in terms of next generation access both now and for the foreseeable future, if progress in other countries is closely monitored we can assess at which UK-wide point investment is necessary as well as learn from the successes and mistakes of other countries. In this way, we will be better equipped to make the right decisions, including regulatory decisions, quickly when the time is right to do so.

There is, however, a strong argument for concentrating initial next generation access investment in areas where high quality current generation broadband is not available today. Whilst it may at first seem logical to roll-out next generation access networks in the most densely populated areas, it is also the case that these areas are already well served by current generation broadband, and in the medium term it is unlikely that the bandwidth currently available will be stretched. Therefore, in addition to ADSL2+, ADSL Max and cable modem, it is recommended that FTTC be employed for addresses on longer loops and FFTB be employed for new build developments. This will be consistent with also closing the current generation digital divide as well as addressing in advance the potential for a next generation digital divide.

Note 1:

(i) These figures are based on the Geo Analysis Broadband Locator database of 30 million UK businesses and households.
(ii) They are concerned with mass market affordable broadband delivered via xDSL or cable modem.
(iii) They assume that all addresses where cable modem (Virgin Media) is available are able to receive at least 8mbps currently and within the medium term (based on recent announcements) at least 20mbps.
(iv) With respect to xDSL it is assumed that everyone within 3km of a BT exchange will be able to receive at least 8mbps, and those within 1.5km at least 20mbps (this in turn assumes ADSL2+ / ADSL Max is rolled out across all exchanges

**Question 2: Do you agree with the principles outlined for regulating next generation access?:**

Yes. In the short to medium term it is important that the regulation is light touch to encourage initial investment as well as trials of different technical solutions. The approach suggested in response to question 1 would deliver a number of technical solutions to a broad cross section of UK addresses; this would provide an ideal environment to explore different regulatory approaches.

**Question 3: How should Ofcom reflect risk in regulated access terms?:**

No comment.

**Question 4: Do you agree with the need for both passive and active access remedies to promote competition?:**

Yes.

**Question 5: Do you consider there to be a role of direct regulatory or public policy intervention to create artificial incentives for earlier investment in next generation access?:**

Yes (see response to question 1 for background). There are significant pockets of the UK that are missing out on current generation broadband, these same pockets and many more are also likely to be the last to benefit from next generation access networks without intervention.

Unlike the previous digital divide in the early days of the Broadband Britain campaign, the next generation digital divide affects both urban and rural areas (since in the absence of cable modem, the key factor determining bandwidth available is distance from exchange rather the decision to xDSL enable an exchange).

As a result the ?top 20? local authority areas, based on total number unlikely to receive greater than 8mbps, include Sheffield, Milton Keynes, Windsor and Maidenhead, Wakefield, London Boroughs of Barnet, Brent and Ealing.

It is therefore recommended that direct regulatory and public policy intervention take place to provide incentives to operators to both close the current generation digital divide and at the same time address the looming next generation digital divide. By combining the efforts of local / community broadband initiatives with those of local, regional and national government bodies resources can be pooled with those service providers. Technically this would be achieved by FTTC for those addresses on longer loops, supplemented by a combination of wireless and satellite broadband. Many of the lessons learnt from the Broadband Britain initiative could be applied.

Such an approach would provide an ideal test bed for different technical solutions and regulatory approaches, as the pockets of addresses that would be served would represent a broad cross-section of UK businesses and households (both in terms of their make-up and the their geographic distribution in relation to existing infrastructure).

This analysis is based on the Geo Analysis database of 30 million UK businesses and

households, plotted to individual postcode level (approx. 20 addresses per postcode). Geo Analysis have worked with a number of UK telecommunications companies using this data to identify not only which exchange each address falls within but also distance from exchange (straight line distance factored to allow for likely copper path). Also, addresses have been plotted against cable modem footprint. The result is a real world assessment of the number of addresses reached by different technical solutions, rather than a top-down approximation. This is essential for accurately identifying pockets of unsatisfied demand.

**Additional comments:**