

Orange response to 3G rollout obligations

Orange is pleased to respond to Ofcom's further consultation on the 2G rollout obligations. Orange previously highlighted its views to Ofcom as part of the Spectrum Framework Review consultation in Autumn 2005.

In the aforementioned response, Orange stated that although it was neutral in respect of the need for guidance on Ofcom's approach to the enforcement of the 3G rollout obligations, we believed that any proposed guidance issued must be legally sound. At the time of the auction, each operator assessed the value of the 3G licence based on the licence terms and conditions specified in the information memorandum. Orange has continued to invest in its 3G network rollout and has met, and exceeded, its 80% rollout obligation based on 384DL/ 128UL outdoors. As the rollout obligation is not due to be satisfied until the end of 2007, no sanction could therefore be imposed before that date. However, Ofcom anticipates it will begin the formal process of assessing compliance towards the end of 2007 so that it would be in a position to make a decision on any non-compliance early in 2008.

Orange expects Ofcom to carry out its detailed investigation in an open and transparent manner, including evidence that a licensee not meeting its licence obligations would and could discharge the rollout obligation in a timely manner.

Orange therefore expects Ofcom to ensure that each 3G licence holder meets its licence obligations regarding rollout by 31 December 2007.

In this consultation, Ofcom is seeking to measure the extent to which 3G services are available to the UK population where they live. Such services should, under normal circumstances, be able to provide a range of applications such as voice, text, video and multimedia services for outdoor reception with speeds up to 384kbps. Coverage to meet this obligation is expected to be primarily urban/suburban rather than rural.

Ofcom states that the aim of this document is to provide guidance and greater regulatory certainty in relation to Ofcom's enforcement policy towards the rollout obligations in the 3G licences in the UK and that the consultation covers two principal issues:

1. how Ofcom intends to measure compliance with the rollout obligations and what, for the purposes of this measurement, it considers as the relevant benchmark against which rollout should be judged, and
2. Ofcom's approach to enforcement of the rollout obligation.

Orange sets out its detailed views below. We raise some questions over the origin of some of the data measurements which we believe need to be resolved between Ofcom and the industry. Ofcom must ensure that there is no delay in clarifying and agreeing the data as all measurements must be taken and agreed by the end of 2007.

Question 1:

Do you have any comment on Ofcom's proposed basic methodology?

Answer 1:

The 3G licence authorises the establishment, installation and use of apparatus to use the specified frequency assignments until 31 December 2021. Each 3G licence contains a condition which requires the licensees to meet certain targets for rollout of their networks:

“The Licensees shall install, maintain and use Radio Equipment (as specified in paragraph 10 of Schedule 1) in such a way as to enable the provision of, by not later than 31 December 2007, and to maintain thereafter, a telecommunications service by means of the Radio Equipment to an area where at least 80% of the population of the UK live.”

In its consultation document, Ofcom proposes four basic methodologies that could be employed:

- Engineering analysis by Ofcom (with location of base stations and other technical details can be provided by the operators);
- Physical field strength measurement by Ofcom or an agent (although an extensive sample is likely to be needed to make statistically significant predictions which may be costly and resource intensive);
- Combination of the above two approaches verified by a sample of field strength measurements;
- Operator self-declaration (either based on prediction, measurement or a combination).

Orange is supportive of Ofcom’s preference for a methodology based on engineering analysis backed up by measurements in the field to verify the results as necessary.

Below, we make detailed comment on some of the technical parameters which would be required as set out and discussed in Annex 6 of the consultation document.

Topographic data¹

Topographic data suggests that the propagation model requires terrain and clutter data to calculate the field strength of the radio signal and that Ofcom proposes using 50m pixel resolution data.

Orange suggests that a single resolution of 100m pixel is deployed for radio field strength as the use of separate resolutions will make modelling overly complex

Composite coverage²

Composite coverage represents the field strength from every transmitter. Ofcom proposes that where the coverage from two or more transmitters overlap, the largest signal value would be chosen from the overlapping coverage areas and the composite coverage calculated to a 100m pixel resolution (although Ofcom also suggests that Ofcom will average the 100m array into 50m pixels).

¹ Paragraph A6.6

² Paragraph A6.7

Orange requests clarification of the above point and suggests that a single resolution of 100m pixel is deployed for composite coverage as the use of separate resolutions will make modelling overly complex

Population data

The consultation document proposes that the 2001 census data is used to analyse the coverage requirements and that the population within an area is grouped in the raw census data into Output areas³. Each Output area represents the residential population of around 300 people over approximately 400m². The average size of the 80% most densely populated Output areas, as stipulated in the WT Act licence, is approximately 100m².

Ofcom then assumes that the number of inhabitants is assumed to be equally distributed inside the Output Area and is mapped to 50m pixel to be analysed within of the planning tool⁴. The total population calculated with coverage is the total number of inhabitants summed from each 50m pixel that has a radio signal level above the minimum threshold value of -110dBm.

The total percentage population coverage will then be calculated by:

$$\frac{\text{calculated total population with coverage}}{\text{total UK population as defined in the 2001 census data}} \times 100$$

Orange's initial analysis shows that an output area of 100m² represents an average of 30 people per output area in the 80% most densely populated area of the UK (based on full postcode and housing density from the 2001 census) which is a factor of 10 different from the Ofcom proposals and would suggest a total UK population in excess of 60 million. Further discussion is required between Ofcom and the industry.

Antenna down tilt⁵

Ofcom proposes an assumption of antenna downtilt of 2dB where data unavailable. Before Orange is able to comment further on this assumption, clarification is requested as to whether Ofcom actually means 2 Degrees rather than 2dB, as antenna beam widths are generally measured at the 3dB beam point of an antenna. In addition, Ofcom specifies degrees in the previous table⁶.

In general, Orange is supportive of Ofcom's preference for a methodology based on engineering analysis backed up by measurements in the field to verify the results as necessary. However, further discussion is required to ensure the appropriate measurement samples are agreed between the operators and Ofcom.

Question 2:

Do you agree that this is an appropriate basis for measurement?

³ Paragraph A6.9

⁴ Paragraph A6.10

⁵ Paragraph A6.2

⁶ Paragraph A6.1

Answer 2:

3G networks can offer Ofcom's proposed approach to measuring the coverage of networks reflects this variety.

In its consultation document, Ofcom details its proposed measurement method which takes into account that 3G networks offer a broad range of services, from simple voice and text to advanced video calling and multimedia.

The primary common pilot channel (Primary CPICH) is used for cell selection, reselection and handover and the handset must be able to receive sufficient Primary CPICH power in order to initiate a 3G call. Ofcom therefore considers that reception of the Primary CPICH is a suitable proxy for the provision of a telecommunication service.

Analysis conducted by Ofcom indicates that, with Primary CPICH power set within the range 5 – 15%, telecommunications services up to data rates of 384 kbps should be available at the edge of cell (at least for a lightly loaded cell). Orange does not support any implied requirement of 384kbit/s at cell edge, as indicated above, as this is unlikely to be consistently achievable. However, we would support '*telecommunications services up to data rates of 384 kbit/s*'⁷.

Ofcom then goes on to assume that Primary CPICH power in the range 5 – 10% is likely to be indicative of urban/ suburban deployment and therefore a value within this range is appropriate for the analysis of coverage of 80% of the population. Ofcom therefore proposes to use a single value for the Primary CPICH power in the range 5 – 10% in its analysis. To verify this percentage, Ofcom will therefore need to know the total power transmitted from each 3G site of each operator. Further discussion is required between the industry and Ofcom to ensure that the same data is being submitted.

In general, Orange supports Ofcom's proposed methodology but additional clarification and further discussion of the requirements and assumptions is required.

Question 3:

Do you have any comments on this assessment criterion?

Answer 3:

As indicated in Question 2, Ofcom proposes to use reception of the Primary CPICH as a proxy for the provision of a telecommunication service. In order to conduct this analysis the minimum signal strength that constitutes reliable reception of the Primary CPICH needs to be established. Ofcom proposes to use Recommendation ITU-R P.1546-22 as the propagation model in its calculation of the received Primary CPICH signal strength⁸.

Orange supports the use of ITU-R P.1546-2.

⁷ Paragraph 7.18

⁸ This is a recommended propagation model from the International Telecommunications Union for point-to-area predictions for terrestrial services such as 3G services and it is available to all

One of the basic rules which is used in network planning calculates the coverage against the statistical fade margin. If the fade margin has been selected such that the service availability at the cell edge is at least 90% then it can be shown that the service availability over the entire cell should be greater than 97%. If there are neighbouring cells and handover is possible then the service availability over the entire coverage area should rise to better than 99%.

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If the service availability at the cell edge is to be 90% then the fade margin must be 1.3 times the standard deviation of slow fading (assuming a normal distribution). The mobile receiver sensitivity given in the 3G specifications (3GPP TS 25.101) is -117dBm. Ofcom states that ITU-R P.1546-2 quotes a standard deviation for slow fading of 5.5 dB for channels wider than 1 MHz.

Orange questions whether ITU-R P.1542-2 specifically states that the slow fading margin is specifically for channels greater than 1MHz bandwidth. Orange therefore requests clarification of where this statement comes from.

Question 4:

Do you have any comment on Ofcom's proposals in relation to population data?

Answer 4:

In order to assess coverage to the population it is necessary to have a database of the population against location for the UK (i.e. where people live).

Ofcom proposes that the 2001 census data is used. Ofcom already has this information available in a format suitable for use with our own planning tools. The way this data is apportioned geographically will need to be agreed.

As well as information about where people live, Ofcom has considered whether to factor in coverage provided for transient populations such as:

- trunk road coverage, and
- commuter influx to city centres during the day.

The MNOs are likely to have invested considerable amounts in providing coverage to these areas, seeking to serve their customers where they want to make calls, rather than where they actually live. Arguably, the utility of mobile communications is at its least in people's homes and at its most when they are out and about. However, the rollout obligation is quite clear that it is 'where people live' which is to be evaluated. Ofcom therefore does not intend to take these factors into account when assessing compliance.

As discussed in its response to question 1 above, it is not clear to Orange how Ofcom has reached a figure of 300 people per 100m² in the 80% population area. Prior to any measurement, Ofcom must publish a full explanation and data set of its assessment of '80% population'.

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