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Response from O2 (UK) Limited

Ofcom Consultation: *Application of spectrum liberalisation and trading to the mobile sector* dated 20 September 2007

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Response from O2 (UK) LIMITED

Ofcom consultation: *Application of spectrum liberalisation and trading to the mobile sector dated 20 September 2007 ("the Consultation")*

I Executive summary

1. Ofcom are proposing a very serious intervention in the mobile telecommunications market. If the proposals are implemented, they will be based on a flawed policy mechanism and will have the certainty of occasioning very substantial costs to some parties (in particular O2) and disruption to customers while conferring benefits which are poorly researched, inadequately supported by evidence, wholly speculative and, on a proper view, insufficient to justify the intervention. Moreover, Ofcom's legitimate objective can be properly and adequately met by adopting a "wait and see" approach and permitting spectrum trading, which will not occasion such certain costs and disruption, at least unless or until the benefits are less speculative. For those reasons, Ofcom's proposals are wholly disproportionate.
2. In order to implement the draft Commission Decision¹ on 900MHz and 1800MHz spectrum in the UK ("the Decision"), Ofcom are required to do no more than designate the 900MHz and 1800MHz bands for UMTS/3G systems and GSM/2G systems in the UK Plan for Frequency Authorisation, and vary existing 900MHz and 1800MHz licences to permit use for UMTS/3G systems.
3. Anything Ofcom choose to do beyond this (require release and re-auction of spectrum currently licensed to O2 and Vodafone, for example) would not be action required by the Decision, but rather action taken because Ofcom consider it desirable or appropriate in the context of implementing the Decision in the UK in light of their various regulatory duties and functions.
4. As the Decision does not prescribe in detail how it is to be implemented, Ofcom have a discretion on how to implement the Decision and can have regard to their wider duties and functions relating to spectrum management, including their duty to promote competition, in deciding how best to do so. However, Ofcom must exercise their powers in a non-discriminatory and proportionate way, having regard to their duties, regulatory principles and public law considerations.
5. Throughout the Consultation Ofcom make an incorrect assumption that there are large cost differences between UMTS900 deployments and the incremental improvement of UMTS2100 networks. This fundamental error in approach infects the entire analysis. O2 shows that cost differences are not significant. In summary Ofcom:

¹ Final draft of Commission Decision on *the harmonisation of the 900 MHz and 1800 MHz frequency bands for terrestrial systems capable of providing pan-European electronic communications services in the Community* – RSCOM07-04 Final, 7 June 2007. This will ultimately be a decision of the European Commission binding on all EU Member States.

In the Radio Spectrum Committee's 13 June 2007 meeting, the chairman confirmed that the final draft of the Decision had been approved and that the next steps would be: (i) adoption by the European Parliament/Council of a Directive proposed by the Commission to repeal the GSM Directive (expected Q3/Q4 2007); and (ii) simultaneous entry into force of the repealing Directive and the Decision. A working document of the RSC produced at their October 2007 meeting suggests that the Decision is currently scheduled for adoption in January 2008.

- a. estimate the benefits per network (NPV) to be £2billion whereas, O2 contend, £71million is a more realistic figure (with a different starting level of infrastructure in 2010 and differing modelling outputs for sites);
 - b. view such benefits as entirely additive for every network installed, when in fact the efficient level of network investment is that on which market demand is served and investors make a return on their cost of capital: beyond this point additional investment is inefficient and wasted. O2 shows that this places an overall cap on benefits of £200m, based on the marginal revenues from mobile broadband evidenced in Ofcom's Consultation document.
6. The stated policy aim of the Consultation (i.e. broader distribution of 900MHz spectrum²) and the objective justification for Option C (i.e. five UMTS900 networks in 2010³) are therefore founded on several false premises. On the basis of O2's well researched and reliable analysis, Ofcom therefore need to revisit the entire basis of the Consultation.
7. Notwithstanding this, Ofcom's analysis fails on its own terms:
- a. Ofcom undertake no new market research for what is such a fundamental and potentially costly intervention. This is a major omission. Instead they seek to post-rationalise the three demand scenarios they have previously determined by selectively referencing research from other, unconnected, projects. Notwithstanding this, the data presented in Ofcom's own analysis supports only the low demand scenario, the one which Ofcom admit⁴ does not require intervention to protect competition; and
 - b. Ofcom admit that in the low demand scenario and with current levels of 2G traffic O2 would not be able to compete effectively in the market in 2010 due to the capacity constraints and the impact on network quality⁵;
 - c. Consequently O2 would not be able to use any of its spectrum for its own mobile broadband deployment; and so
 - d. Ofcom's policy objective for intervention for 2x7.5MHz release (five operators using 900MHz spectrum for mobile broadband) could not be achieved.
8. Given the uncertainties about the future mobile broadband market, Ofcom should look at a very broad range of scenarios; not just in terms of the level of demand, but also the nature of that demand (i.e. the type of traffic) and substitutability (e.g. WiFi⁶), and ensure

² At paragraph 12.12 of the Consultation.

³ At paragraph A5.20 of the Consultation.

⁴ At paragraph 5.27 of the Consultation.

⁵ At paragraph A9.141 of the Consultation.

⁶ <http://www.prnewswire.co.uk/cgi/news/release?id=213277> Orange Signs WiFi Deal With The Cloud; 20th November 2007. "The Orange WiFi Access can be accessed through Orange's Business Everywhere mobile data card offering. This service includes a single datacard that can access several of the WiFi, HSDPA, 3G, EDGE, GPRS and 2G networks

that all arguments are supported by independent research, analysis and evidence. If, for example, Ofcom were to consider a scenario where mobile broadband is the predominant source of traffic on UMTS networks, then overall cost advantages rest with those network operators who have access to the most spectrum capacity.

9. Furthermore, if that capacity is within large contiguous assignments (Orange and T-Mobile's 1800MHz spectrum, for example) the deployment of UMTS' Long Term Evolution would allow those operators holding such assignments to offer high data rates (c.100Mbit/s) by virtue of the large carrier bandwidths available to them. Accordingly, Orange and T-Mobile would have a future competitive advantage in such a scenario over O2 and Vodafone, whose spectrum is fragmented.
10. O2 believes that if Ofcom were to analyse a broader and more long term range of future mobile broadband scenarios then they would realise that the limited cost advantage for UMTS900 networks has short-lived effects and that the ability of MNOs to capitalise on them is constrained by the cost of clearing highly utilised 900MHz spectrum. In contrast, cost differences and competitive advantages for 1800MHz are enduring for the long term and, with large amounts of spare 1800MHz spectrum available, readily useable once suitable equipment is on the market. By not addressing these scenarios at all, Ofcom cannot reach a proportionate and non-discriminatory conclusion.
11. In responding to Ofcom's analysis O2 have had to focus on Option C. However this should not be construed as acceptance of intervention as a viable solution to resolve any issue in the market, whether that advantage is accrued by 900MHz or 1800MHz licensees. Significant irreversible decisions by regulators based on limited or no information will always produce an imperfect outcome for society.
12. Intervention should be used only if there is no less intrusive means of achieving a policy aim. Oxera Consulting Limited's analysis set out at **Annex C** shows that Ofcom's reliance on theoretical conclusions with regard to spectrum trading is in error. Using the same theoretical framework as Ofcom, Oxera has developed a simulation model which shows that trades can take place if the cost of clearing the spectrum is not prohibitive.
13. Furthermore, commercial roaming can also be available on the market. Both of these outcomes are enhanced if the regulator sends a strong signal to the market regarding the undesirable outcomes of liberalisation and the possibility and basis for future intervention if there is market failure. Ofcom's discussion of incentives to trade or provide roaming does not address the impact that any such signal in this Consultation may have in securing an effective trading market.
14. Even if Ofcom could justify intervention (which O2 shows it could not), Ofcom will have exercised their powers in a disproportionate and market-distorting way if they implement their current proposals in the Consultation to:

available, automatically choosing the fastest connection possible. WiFi connectivity will be bundled in some of Orange's new Business Everywhere plans in order to give users maximum flexibility for usage in the UK and abroad."

- a. require O2 and Vodafone each to give up 2 x 7.5MHz of 900MHz spectrum;
 - b. require that spectrum be given up as soon as 2010 since this (i) will be totally impracticable; (ii) would be at enormous cost to O2; (iii) could [redacted]; and (iv) would involve forced migration of O2 customers to its 3G network and devices, irrespective of customers' own preferences;
 - c. decide now to exclude O2 and Vodafone from any future auction of released 900MHz spectrum when that decision should be subject to a proper assessment at the time of the auction, which could be several years from now, to establish whether the circumstances at that time would still warrant such a serious intervention by the regulator;
 - d. intervene in the highly competitive mobile services market in a way which will inevitably distort competition now and impose significant costs only on certain players in that market, without carrying out a thorough competition analysis, the most appropriate model for which would be the assessment normally undertaken in a SMP or Enterprise Act 2002 market review; and
 - e. not correctly take into account the significant costs incurred by O2 and Vodafone in not only clearing and releasing the spectrum to be re-auctioned, but also in clearing the spectrum they will retain, in order to achieve the stated objective; and
 - f. fail to appreciate the market distorting and anti-competitive effects of drastically [redacted].
15. Ofcom have not, in O2's view, carried out an adequate review of the market and the impact their proposals would have on competition and consumers. In particular, Ofcom have not sufficiently considered the very serious impact of compulsory spectrum release on O2 and Vodafone's ability to compete (both in relation to servicing existing 2G customers and competing for new 3G customers), or the detrimental effects likely to be felt in the retail market (namely the effect on consumers currently enjoying cheap basic pre-pay 2G services, SIM-only deals and a good choice of mobile devices at a variety of price points).

16. Ofcom have miscalculated the likely costs of the spectrum clearance required to achieve the stated objective:
- a. Ofcom assume that only 2x7.5MHz will have to be cleared by each of O2 and Vodafone, whereas in fact each operator will have to clear an additional 2x5MHz of its remaining spectrum for its own refarming, in order to achieve the stated objective for the intervention;
 - b. Ofcom estimate the costs of clearance will be £750 million (based on 2x7.5MHz being cleared), whereas the true direct costs are likely to be £2.5 billion (based on 2x12.5MHz being cleared and bearing in mind that such a clearance is in any event constrained by available proportionate and non-discriminatory mitigation techniques);
 - c. Ofcom assume that forced 2G to 3G migration can be used to take traffic out of 2G networks. O2's analysis shows that forced migration will distort competition in the retail market and reduce investment going forwards. It cannot be relied upon in any proportionate decision. [§<];
 - d. Notwithstanding (c), even with such a migration, the limiting factor on clearing 2G spectrum will be [§<]. Ofcom assume E-GSM is largely unused and Synthesised Frequency Hopping ("SFH") is deployable, whereas in fact E-GSM is already in use⁷ and O2 has already deployed a form of SFH. [§<]⁸. [§<];
 - e. As Ofcom's chosen 2G mitigation techniques are not in fact available, their assumed costs are presumably flawed, as are their assumed timings for spectrum being freed for use by incumbents or others;
 - f. The only alternative method for coping with spectrum loss is cell splitting. This will cost £2.5bn and result in 7,000 more 2G cell sites than we see today. The use of this technique would be constrained by [§<] and its broader impact on citizens. Such an outcome would be politically unacceptable;
 - g. Ofcom will also need to revisit their assumption that O2 and Vodafone can cope with a one-off profit shock in light of the multi-billion pound impact on the industry as a whole. Economic theory dictates that the cost of clearance will inevitably be passed on to consumers in one form or another (higher prices than the counterfactual, less innovation, less investment etc) and is thus a cost to society, whomsoever ostensibly bears it in financial terms initially and so Ofcom should be wary of imposing such significant and certain costs on society based on speculative and uncertain benefits;

⁷ O2 believes that Ofcom's measurements of its use of E-GSM spectrum are incorrect. Ofcom's measurement technique to assess the carriers to which the measurement device listens while in idle mode significantly underestimates O2's use of E-GSM spectrum because handsets are normally directed to use E-GSM only when a call is in progress and not when the handset is in idle mode. To the extent that Ofcom have relied on these incorrect measurements in arriving at their proposals, those proposals are based on flawed data and should be reviewed.

⁸ See paragraphs 164 to 168 of this Response.

- h. Ofcom's resultant cost benefit calculation is therefore flawed. Rather than achieving £6.25 billion of benefits at limited cost to society and 10,000 fewer sites, O2 calculates a net loss to society of £3.15 billion and 5,750⁹ more cell sites, plus a further loss of £9 billion in future funds available for investment (see further **Annex A**);
- i. Absent intervention by Ofcom, O2 believes that [redacted] and potentially clear 900MHz spectrum for its own use (2x5MHz) by around [redacted], subject to a demand requirement¹⁰. Any view as to the availability of further spectrum for auction to others would, at this point in time, be highly speculative.

⁹ The small number of avoided UMTS sites is swamped by the 7,000 more sites required to partially mitigate congestion in 2G networks.

¹⁰ [redacted]

17. In summary, the costs of clearance are as follows:

Sum of costs of clearance

Source	Total cost PV (O2 + Vodafone)	Comment
Cost to clear 2x12.5MHz of spectrum by 2010	£2,500 million	Financial impact on O2/VF, but borne by society in higher prices than the counterfactual, less innovation etc.
Handset subsidies for migration	£750 million	Each of O2 and Vodafone have to discount 3G handsets to £0 RRP in order to reach price parity with 2G devices.
Loss of available funds for investment	£9,000 million	Reduction in profits caused by the tariff reductions required for O2/VF to force migration from 2G to 3G and the subsequent competitor responses.
Loss of price competition in 2G pre-pay market	£850 million ¹¹	Loss to one particular group in society caused by [X] reducing the level of effective competition in the retail market for 2G services.
TOTAL	At least £13 billion	All bar £750m of these costs are borne by society.

18. O2 would strongly welcome the opportunity to discuss its analyses in detail so that Ofcom can understand how the differences arise and how O2 has come to the conclusions it has on the costs and societal losses of Option C. Ideally, this would precede a further consultation (which, in the circumstances, seems essential) by Ofcom on these issues.

19. In conclusion on the costs and benefits:

- a. There are likely to be various economic advantages accrued by different spectrum licensees at different times in the future: a short term coverage cost advantage for 900MHz licensees and potentially an enduring capacity and speed advantage for 1800MHz licensees. There also appear to be ample incentives for trading by both sets of licensees. Furthermore, commercial roaming will be available on the market;

¹¹ Annex B refers.

- b. On Ofcom's own analysis (large cost differences between 900MHz and 2100MHz networks and relatively small clearance costs) trading would take place. Therefore, regulatory intervention to achieve a wider distribution of 900 MHz spectrum would be unnecessary; whereas
 - c. On O2's analysis (small cost differences between 900MHz and 2100MHz networks and large clearance costs), trading might be delayed by the cost of clearing the 900MHz networks, but would take place, although 900MHz spectrum would be less important in view of the small cost differences between 900MHz and 2100MHz.
20. O2 proposes that Ofcom adopt a less intrusive "wait and see" approach, which is dictated by the circumstances - a highly competitive market for mobile services currently, the significant costs burden on O2 and Vodafone (and society generally) of Option C, the disruption to 2G customers and impracticability of setting a deadline for spectrum release, the uncertainty of future demand scenarios for mobile broadband, and the irreversible nature of compulsory spectrum release.
 21. The "wait and see" approach would entail Ofcom liberalising spectrum in the hands of incumbents and making tradable both the 900MHz, 1800MHz and 2100MHz licences in, say, 2009, and waiting to see how the market develops namely; how the demand for mobile broadband services evolves over time, how customers will choose to consume broadband (substitutability), whether spectrum is traded, and whether the fact that different spectrum is held by a small number of players in fact has any impact on competition in the market, before making any further decision on whether 900MHz or 1800MHz spectrum should be released and redistributed by way of an auction.
 22. The final statement on this matter could include a clear articulation of undesirable outcomes (for example, a lessening of competition) which Ofcom would intervene to prevent in the future (based on better information about demand and 2G mitigation) and the powers they would exercise. Such a signal would have a positive effect on the functioning of the secondary spectrum market.
 23. O2 would suggest that Ofcom should review the situation in 2012, reserving the right to exercise such of their spectrum management powers as they see fit at that time to remedy any failure in the market that has arisen. In O2's view, such a failure would be highly unlikely.
 24. The "wait and see" approach is, in O2's opinion, essential in order to avoid the risk of regulatory failure in view of the huge uncertainties over take-up of mobile broadband services and the significant impact compulsory spectrum release would have on O2, Vodafone and the market, and on future investment in spectrum exploitation generally.
 25. The "wait and see" approach has the additional benefit of being less likely to constitute a breach by Ofcom of their duty to act proportionately and not to distort competition, and is therefore [§<]. In the meantime, uncertainty over Ofcom's ability to exercise its powers based on speculation and limited information (as witnessed in this Consultation) would reduce investment incentives for all spectrum licensees.

26. The UK has benefited from very aggressive price competition and a huge increase in minutes of use per customer over the last five years. O2 has been at the forefront of this growth, creating both market leading returns for its shareholder whilst giving customers many more voice minutes per pound spent. [3<]. O2 believes that Ofcom's proposal would unduly penalise O2 (relative to its competitors) for its historical contribution to price competition in the UK market. Consequently, by not considering the circumstances of individual operators Ofcom would be discriminating and acting disproportionately.

II Introduction to Response

27. In responding to the Consultation, O2 has focused on Option C, which Ofcom state is, in their initial view, the most appropriate method of implementing the Decision in the UK and the most likely to meet their statutory duties and objectives. References in this Response to Ofcom's proposals therefore refer primarily to Ofcom's preferred Option C and any other proposals expressed as being preferred or intended by Ofcom (for example, Ofcom's proposal to exclude O2 and Vodafone from any forthcoming auction of released 900MHz spectrum).
28. As far as the other Options are concerned, whilst O2 would welcome Option A applying to the 900MHz operators as it does to the 1800MHz operators, O2 does not consider either Option B or Option D would be viable. Ofcom will be aware that O2 is of the view that, absent a finding of SMP in the access market, Ofcom do not have the legal power to impose an obligation to provide national roaming services under Option B¹². O2 agrees with Ofcom's assessment that a full release of 900MHz spectrum under Option D would not only be impractical but detrimental to society, as it would far outweigh any benefits accrued by broader distribution of 900MHz.
29. In our costs analysis, we have used the counterfactual of an NPV of the costs until the end of 2021 (rather than Ofcom's counterfactual of an NPV of the costs over 20 years, i.e. from 2010 to 2030) as, in O2's view, this is a more appropriate benchmark given that: (i) all 2100MHz licences expire on 31st December 2021; and (ii) 20 years is longer than the asset lives of either UMTS900 or UMTS2100 equipment and so the cost assessment would need to take network refurbishment into account. If Ofcom seek to rely on any NPV2030 then they should clearly articulate the basis under which MNOs will retain their 2100MHz spectrum. Making a decision on this basis would set a legitimate expectation amongst licensees that their licences would be renewed until 2030.
30. Finally, if Ofcom intend to rely, in any follow-up discussion paper or final statement, on any as yet undisclosed internal or external analyses or reports or other new material, including anything contained in any Consultation responses, O2 would request sight of that material and an opportunity to comment on it in advance of Ofcom's reliance upon it. O2 understands that some data may be subject to commercial confidentiality, but would request sight of redacted, if not complete, versions of all such material in the interests of procedural fairness.

¹² Reference is made to O2's previous submissions on this subject: <http://www.ofcom.org.uk/consult/condocs/roaming/>.

31. As Ofcom are aware, the matters discussed in the Consultation are of particular and significant importance to O2 and Vodafone. Ofcom should therefore allow them, and their advisors every opportunity to critique and comment on Ofcom's legal arguments and economic and technical analysis before Ofcom come to any final conclusions on these matters. In O2's view, it can only benefit Ofcom's analysis for O2 to meet with Ofcom to discuss its own analyses and the Oxera report in detail.

III Legal Context

32. The following section considers the legal background to the Consultation, including the draft RSC/Commission decision and Ofcom's powers and duties in implementing it.

RSC/Commission Decision

33. Ofcom's eventual decision to liberalise the 900MHz and 1800MHz spectrum (i.e. to allow spectrum to be used for 3G/UMTS as well as 2G/GSM) will flow from a Commission decision, which the UK will be required to implement once it is adopted (currently scheduled for January 2008). Ofcom refer to this decision as "the RSC Decision". It is referred to as "the Decision" in this Response.
34. The Decision is currently in draft, the final text having been approved by the Radio Spectrum Committee on 22 May 2007. Article 3 of the Decision is as follows:

"Article 3

- (1) The 900 MHz and 1800 MHz bands shall be **designated and made available** for GSM systems, by [insert actual date of entry into force of the Directive repealing the GSM Directive].*
 - (2) The 900 MHz and 1800 MHz bands shall be **designated** from [insert actual date of entry into force of the Directive repealing the GSM Directive] and **subsequently made available** for other terrestrial systems capable of providing pan-European electronic communications services, as listed in the Annex and subject to the conditions laid down therein.*
 - (3) Member States may designate and make available the 900 MHz and 1800 MHz bands for other terrestrial systems not listed in the Annex, provided that they ensure that such systems can co-exist with GSM systems and systems listed in the Annex on their own territory as well as in neighbouring Member States.*
 - (4) Member States shall ensure that other systems referred to in paragraphs (2) and (3) give appropriate protection to systems in adjacent bands."*
(emphasis added)
35. The Decision will therefore require Member States (i.e. Ofcom) to (i) designate and make available the 900MHz and 1800MHz bands for GSM/2G systems by the date that the

Directive repealing the GSM Directive comes into force, and (ii) designate by the same date, but "*subsequently*" make available, those same bands for UMTS/3G systems.

36. "*Designate*" in this context would involve Member States amending their national frequency allocation tables (or equivalents).
37. "*Make available*" in this context means making spectrum available for particular uses or for use by particular systems (e.g. GSM/UMTS systems), not making it available to particular users or operators. This interpretation is supported by the statement in the Commission's proposal¹³ to repeal the GSM Directive that the Decision "*does not cover the issuance by Member States of the rights to use the spectrum*". Where uses require individual licences, making available means varying existing licences to permit the new use or issuing new licences for that use (where spectrum is available).
38. **Once the Decision is adopted, Ofcom will be required to implement it in the UK simply by designating the 900MHz and 1800MHz bands for UMTS/3G systems as well as GSM/2G systems in the UK Plan for Frequency Authorisation, and by varying existing 900MHz and 1800MHz licences to permit use for UMTS/3G systems.**
39. Anything Ofcom choose to do beyond this (for example, require release and re-auction of spectrum currently licensed to O2 and Vodafone) will *not* be action required by the Decision, but rather action taken because Ofcom consider it desirable or appropriate in the context of implementing the Decision in the UK in light of their various regulatory duties and functions¹⁴.
40. As the Decision does not prescribe in detail how it is to be implemented, in exercising their discretion Ofcom must have regard to their wider duties and functions relating to spectrum management, including their duty to promote competition, in deciding how best to do so. Ofcom must also exercise their powers in a non-discriminatory and proportionate way, having regard to their duties, regulatory principles and public law considerations.
41. In any event, whilst the Decision remains in draft and is therefore not yet a binding measure, Ofcom are not required to do anything to implement the Decision. Even after adoption, allowing current users to use the spectrum for UMTS/3G systems does not have to occur immediately, but rather at a point in time "*subsequently*" to the designation. Aside from the Decision considered here, only one other draft decision in fourteen recent Commission decisions on spectrum has used the word "*subsequently*" in relation to

¹³ Proposal for a Directive of the European Parliament and of the Council of repealing Council Directive 87/372/EEC on the frequency bands to be reserved for the coordinated introduction of public pan-European cellular digital land-based mobile communications in the Community, Brussels, 25.7.2007, COM(2007) 367 final (page 8)
http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/com/com2007_367_en.pdf.

¹⁴ In paragraph 7.11 of the Consultation, Ofcom appear to be confused as to what is actually required by the Decision (and, in relation to which, Ofcom can give notice to revoke for the purpose of securing compliance with an international obligation of the UK) and what Ofcom propose by way of spectrum release and redistribution to other users, which is not required by the Decision and (in relation to which Ofcom must rely on other powers to revoke the relevant licences).

making spectrum available – Broadband Wireless Access (RSCOM07-59), which requires the 3600-3800 MHz spectrum to be designated by 1 January 2012 and "subsequently" made available. The Decision is therefore atypical in its use of the word "subsequently" and there is no helpful precedent as to what is meant by the term.

42. In the Consultation¹⁵, Ofcom note that the timescale cannot be open-ended and that a comparison of other Community legislative acts relating to spectrum suggests that implementation periods are usually between six months and three years. They go on to say "*but in this case account should be taken of the fact that some of the alternative implementation methods may take longer ... because of their impact on and disruption to existing use of spectrum*", and that five years would be the longest reasonable implementation period in Ofcom's view.
43. Five years from January 2008, when the Decision is expected to be adopted¹⁶, would be January 2013. It is therefore, in O2's view, inconsistent for Ofcom later in the Consultation to say that spectrum could be released by O2 and Vodafone in 2010¹⁷. Release in 2010 would not even allow the three years Ofcom indicate as insufficient given the impact and disruption inherent in their proposals, in particular the time necessary to prepare for transfer from 2G to 3G, especially in respect of existing 2G customers.
44. In terms of timing, Ofcom do not appear to have followed their own analysis in the Consultation with regard to how long should be allowed for implementation of the Decision. Nor have they followed their own previous estimates of time taken to migrate customers/recover spectrum in the context of standard periods of notice for revocation on spectrum management grounds¹⁸.
45. Issues of timing in terms of the practicalities of releasing spectrum by 2010 are dealt with in more detail at **Section VII** below.

¹⁵ Paragraphs 3.11 to 3.14.

¹⁶

http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/rsc21_public_docs/rscom07_77_topics.pdf, page 3.

¹⁷ Paragraph 14.27.

¹⁸ In the November 2003 *Spectrum Trading Consultation*, Ofcom state that:

"6.6.4 *Although the exact notice period may need to be determined on a case by case basis, Ofcom proposes that a **standard notice period of five years would be applied in licence classes where tradability is introduced**. Ofcom believes that this approach broadly reflects current practice, both where licences are annually renewable and where licences continue subject to notice periods. It reflects, among other things, typical equipment lives and **requirements for migration of affected users**.*" (emphasis added)

In the follow-up *Statement on Spectrum Trading: Implementation in 2004 and beyond* (August 2004):

"6.5 *Ofcom has considered the comments made by respondents and **remains of the view that 5 years is an appropriate minimum notice period for revocation of existing non-auctioned licences for spectrum management reasons**. This, together with the need for any such revocation decision to be objectively justified, should, we believe, **give adequate security to licensees** to encourage efficient use of spectrum and promote investment and innovation, while at the same time **giving Ofcom the ability to recover spectrum if necessary for spectrum management reasons** (...)." (emphasis added)*

46. Another important aspect of the Decision is the emphasis it places on safeguarding the existing efficient operation of GSM networks servicing hundreds of millions of users across the EU, whilst paving the way for UMTS systems to be provided “*subsequently*”, as market, technology and, importantly, spectrum availability allow.
47. The Recitals to the Decision demonstrate that the Radio Spectrum Committee (and the Commission itself, if the Decision is adopted unamended) is concerned to protect GSM:
- “The current use of GSM in the 900MHz and 1800MHz bands **should remain protected** in the whole Community as long as there is a reasonable demand for the service.”* (Recital 6);
- “... Member States should **take all necessary measures to protect continued operation of GSM systems** from harmful interference.”* (Recital 8) (emphasis added)
48. In implementing the Decision, Ofcom should therefore ensure that the provision of GSM/2G services is protected, which, in O2's view, means that Ofcom should not require current users of 900MHz or 1800MHz spectrum to act in a way which would jeopardise the provision of, or competition in the market for, those services.
49. To the extent that requiring release of the 900MHz spectrum would cause unacceptable disruption to O2 and Vodafone's 2G customers and constrain O2 and Vodafone's ability to provide GSM/2G services by effectively forcing them to adopt a 3G strategy and to migrate their customers to 3G services, Ofcom are not protecting the GSM systems currently using 900MHz spectrum.
50. As far as dealing with any competitive distortions resulting from national legacy situations is concerned, Recital 16 states that:
- “...The existing regulatory framework gives Member States the tools to deal with these problems in a proportionate, non-discriminatory and objective manner, subject to Community law including the Authorisation Directive and the Framework Directive.”*
51. It is therefore the case that, whilst the Decision does not prescribe in detail how it is to be implemented, and Ofcom have a discretion in deciding how best to do so, O2 believes Ofcom are nevertheless constrained by the requirement to:
- a. ensure that existing 2G systems are protected, which, in O2's view, includes:
- ensuring that sufficient spectrum is available for GSM systems to meet the market demand from consumers;
 - ensuring that consumers are not forced to purchase new devices or change their service in order to facilitate a change of technology; and

- b. deal with any distortions of competition that might arise in a proportionate, non-discriminatory and objective manner, subject to Community law including the Authorisation Directive and the Framework Directive.

Ofcom's relevant statutory duties

52. As set out above, the Decision does not require Ofcom to make the 900MHz or 1800MHz spectrum available to other users and operators who wish to offer 3G services. These proposals are purely what Ofcom consider to be desirable or appropriate in the context of their implementation of the Decision in the UK.
53. Ofcom will therefore be relying on their spectrum management powers under domestic law¹⁹ to require the release and re-auction of blocks of 900MHz spectrum already licensed to O2 and Vodafone. In exercising these powers, Ofcom must have regard to their duties under the Wireless Telegraphy Act 2006 ("the WTA") and the Communications Act 2003 ("the Act"), which derive in part from EU legislation:
 - a. Ofcom's duties under sections 3 and 4 of the Act include duties to:
 - secure the optimal use for wireless telegraphy of the electro-magnetic spectrum;
 - secure the availability throughout the United Kingdom of a wide range of electronic communications services;
 - further the interests of consumers in relevant markets, where appropriate by promoting competition;
 - have regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed;
 - have regard to the different needs and interests of all persons who may wish to make use of the electro-magnetic spectrum; and
 - in relation to their functions under the enactments relating to the management of the radio spectrum (including where they grant, vary or revoke spectrum licences), act in accordance with the six Community requirements²⁰ and the Framework Directive, which the Act implements, namely to:

¹⁹ Ofcom, for example, has the power under Section 2(2) of the European Communities Act 1972 to do things arising out of or related to a Community obligation.

²⁰ The Community Requirements give effect to the requirements of Article 8 of the Framework Directive (Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services) and are to be read accordingly.

- exercise their powers impartially and transparently (Article 3(3), Framework Directive);
 - take the utmost account of the desirability of carrying out their functions in a manner which does not favour one form of electronic communications network or service over another (section 4(6)); (Ofcom misinterpret this²¹ as being the same as their obligation under Article 8(1) of the Framework Directive to take the utmost account of the desirability of making regulations technologically neutral);
 - ensure that measures taken to promote competition in the provision of electronic communications networks and services are proportionate to that objective (Articles 8(1) and 8(2));
 - promote competition (Section 4(3)) and ensure there is no distortion of competition (Article 8(2)(b));
 - encourage efficient investment in infrastructure, and promote innovation (Article 8(2)(c));
 - encourage the efficient use and ensure the effective management of radio frequencies (Article 8(2)(d)); and
 - ensure that the allocation and assignment of radio frequencies are based on objective, transparent, non-discriminatory and proportionate criteria (Article 9(1)).
- b. Ofcom's duties under section 3 of the WTA when carrying out radio spectrum functions include duties to have regard to:
- the extent to which the electromagnetic spectrum is available for use, or further use, for wireless telegraphy;
 - the demand for use of the spectrum for wireless telegraphy;
 - the demand that is likely to arise in future for the use of the spectrum for wireless telegraphy;
 - the desirability of promoting the efficient management and use of the part of the electromagnetic spectrum available for wireless telegraphy;
 - the economic and other benefits that may arise from the use of wireless telegraphy;
 - the development of innovative services; and

²¹ Paragraph 4.23 of the Consultation.

- competition in the provision of electronic communications services.
- c. Ofcom's own regulatory principles include statements that they will:
- strive to ensure that their interventions will be evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome; and
 - always seek the least intrusive regulatory mechanisms to achieve their policy objectives.

General public law considerations

54. As a public authority, Ofcom are required to carry out their functions and exercise their spectrum management powers reasonably and rationally. Ofcom may also be restrained from frustrating a legitimate expectation.

Proportionality

55. All powers which Ofcom propose to exercise pursuant to Option C derive from European Union law²². Accordingly, there is a general obligation on Ofcom to exercise those powers proportionately²³.
56. More specifically, Article 8 of the Framework Directive, which has direct effect on Ofcom as an emanation of the state, provides as follows:

*"Member States shall ensure that in carrying out the regulatory tasks specified in this Directive and the Specific Directives, the national regulatory authorities take all reasonable measures which are aimed at achieving the objectives set out in paragraphs 2, 3 and 4. **Such measures shall be proportionate to those objectives.**" (emphasis added)*

57. In implementing their proposals, Ofcom would be plainly carrying out regulatory tasks specified in the Directive. In addition, they would be doing so while aiming to achieve *inter alia* the following objectives set out in paragraphs 2 of Article 8:

"(c) encouraging efficient investment in infrastructure, and promoting innovation; and

(d) encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources."

²² In particular, the spectrum management powers in Article 9 of the Framework Directive.

²³ Case 122/78 *Buitoni* (1979) ECR 677, Paragraph 16, Judgment of 20 February 1979; Case 66/82 *Fromonçais* (1983) ECR 395, Paragraph 8, Judgment of 23 February 1983.

58. Accordingly, all measures taken by Ofcom in this regard must be proportionate to these objectives. This requires a close scrutiny of the balance between the benefits and the disbenefits of the intervention. Moreover, for a measure to be proportionate, it must be no more than what is appropriate and necessary to achieve the relevant objective²⁴ and, where there is a choice between several appropriate measures, the least onerous measure must be used²⁵.

Variation and revocation

59. Ofcom's powers to vary and revoke WTA licences are contained in Schedule 1 of the WTA. Where variation or revocation is, in the opinion of Ofcom, necessary or expedient for the purpose of securing compliance with an international obligation of the UK (e.g. a European Commission decision), Ofcom must do so by notice to the licensee, and the terms of the licence can be disregarded (paragraph 8(5)).
60. Ofcom can also simply vary or revoke a licence by notice to the licensee, but this is subject to the terms of the licence (which may limit Ofcom's powers or at least specify periods of notice required before Ofcom can vary or revoke) (paragraphs 6 and 8(2)).
61. In the present case, O2's licence contains provisions permitting variation or revocation on one year's notice for spectrum management reasons, so Ofcom should at least give no less than one year's notice to require release of some of the 900MHz spectrum currently used by O2. No notice would be required to vary the licence in order to allow use for 3G/UMTS for the purpose of securing compliance with the Decision.
62. In O2's view, Ofcom should, in this context, give a significantly longer period of notice to require release of some of the 900MHz spectrum currently used by O2, in view of Ofcom's own previous policy statements that non-auctioned licences would not be revoked for spectrum management reasons save on five years' notice in order to allow for typical equipment lives and for the migration of affected users²⁶. O2 agrees that the

²⁴ *R v Secretary of State for the Environment, ex parte National and Local Government Officers' Association* (1992) 5 Admin LR 785 at 799, sub nom *National and Local Government Officers' Association v Secretary of State for the Environment* (1992) Times, 2 December, CA, per Neill LJ (principle in European Union law requires that the means used to attain a given end should be no more than what is appropriate and necessary to attain that end).

²⁵ Case T-9/98, *Mitteldeutsche Erdoel-Raffinerie GmbH v Commission of the European Communities*, paragraph 115; Case 15/83 *Denkavit Nederland* [1984] ECR 2171, paragraph 25.

²⁶ In the November 2003 *Spectrum Trading Consultation*, Ofcom state that:

"6.6.4 *Although the exact notice period may need to be determined on a case by case basis, Ofcom proposes that a **standard notice period of five years would be applied in licence classes where tradability is introduced.** Ofcom believes that this approach broadly reflects current practice, both where licences are annually renewable and where licences continue subject to notice periods. It reflects, among other things, typical equipment lives and **requirements for migration of affected users.**" (emphasis added)*

In the follow-up *Statement on Spectrum Trading: Implementation in 2004 and beyond* (August 2004):

"6.5 *Ofcom has considered the comments made by respondents and **remains of the view that 5 years is an appropriate minimum notice period for revocation of existing non-auctioned licences for spectrum management reasons.** This, together with the need for any such revocation decision to be objectively justified, should, we believe, **give adequate security to licensees** to encourage efficient use of spectrum and promote investment and innovation, while at the same time **giving Ofcom the ability to recover spectrum if necessary for spectrum management reasons** (...)." (emphasis added)*

orderly migration of users would, in particular, take much longer than one year. O2 is strongly of the view, expressed by Ofcom in relation to Calls to Mobiles²⁷, that it is for the market and not regulators to determine the efficient migration rate from 2G to 3G networks. By forcing migration on O2 and Vodafone Ofcom would not be acting consistently.

63. As regards O2 being aware that their 2G licence might be revoked in this way, Ofcom state in paragraph 7.11 of the Consultation that, in light of their previous statements and recognising that the Decision imposes an obligation on the UK to make 900MHz and 1800MHz available for 3G use, they consider that 2G licensees are aware of the possibility that their licences could be revoked or varied for the purpose of securing compliance with the UK's international obligations.
64. As set out above, it is not the requirement to comply with international obligations (i.e. the Decision) that requires spectrum release, but what Ofcom consider to be desirable in this context. O2 was therefore not aware of the possibility of its licence being revoked in connection with the Decision. Moreover, as set out above, Ofcom's previous statements did not indicate that O2's licence might be revoked on anything less than five years' notice.
65. Ofcom should have regard to the relevant effects in this case that the five-year notice period seeks to mitigate, namely:
 - a. the economic interests of incumbents and their customers (paragraph 6.7.13 of the 2003 Spectrum Trading Consultation);
 - b. the sheer scale and cost required for 2G mitigation and migration of affected users, not least the likely time required to acquire and implement around 7,000 cell sites at an acceptable cost to O2 and Vodafone and society;
 - c. the impact of 7,000 more cell sites on citizens and the environment;
 - d. typical equipment lives (being 10 years) for O2's on-going 2G investments (e.g. EDGE deployment to support the iPhone in 2007); and
 - e. their previous statements and the previous practice of the Radiocommunications Agency, which indicated that significant notice would be provided in any event.
66. [redacted]
67. The following sections consider whether Ofcom have exercised their discretion lawfully in terms of their proposals to require release of 900MHz spectrum (**Sections IV to VII**) and re-auction it to other operators whilst excluding O2 and Vodafone from that auction (**Section VIII**).

²⁷ See Annex B to this response at paragraphs 142 to 146.

IV Ofcom's stated policy aim and its implementation risk regulatory failure

The mobile broadband market

68. Ofcom state that future demand for 3G/mobile broadband services is "*uncertain*". Equally uncertain are, among other things: the value of the spectrum, the benefits to operators of using UMTS/3G rather than GSM/2G, competition and efficiency benefits and the number of operators that the market would support. Indeed, uncertainty is expressed in relation to various aspects of the proposals on over 70 occasions in the Consultation.
69. Liberalisation of 2G mobile licences has been a subject of policy debate since the 3G auction in 2000 and is one of the most important policy decisions Ofcom will make with regard to mobile spectrum this decade. The absence of any original market research on which to base Ofcom's analysis must call into question the veracity of Ofcom's "initial view". Furthermore, when one looks at similar important consultations, such as the *Digital Dividend Review* and *Next Generation Access*, these consultation documents did benefit from extensive market and consumer research to inform Ofcom's decision-making.
70. At **Annex B**, O2 presents a commentary on the market research relied on by Ofcom in this Consultation. In summary, with respect to future mobile broadband demand, it says:
- a. About 10% of post-pay customers would pay £7.50 per month for a mobile broadband service. The number of pre-pay customers willing to pay has not been researched, but the profile of customer interest in mobile broadband suggests a user profile much as we see today: male, high value and post-pay;
 - b. It is not proven that customers are quality or coverage elastic to the extent that they would pay or consume more if there were quality enhancements, in fact Ofcom assert that consumers will behave differently with regard to quality when compared to the nearest substitute product²⁸ ; and
 - c. Outdoor and rural coverage is the predominant requirement of users, based on Ofcom research on where people would use mobile broadband. For the indoor locations mentioned by consumers, there would be substitute networks available in most cases, namely WiFi or fixed access.
71. **All of the above points to the low demand scenario rather than the medium or high scenarios.**
72. [X]

²⁸ Paragraph 5.23 of the Consultation refers. Further, Ofcom note at paragraph 6.8 that their assertions about quality sensitivity are not conclusive. There is therefore no data to support this important limb of Ofcom's argument.

73. In O2's view, the circumstances and construction of this Consultation suggest that Ofcom may have sought to post-rationalise the demand scenarios by selectively (and incorrectly) drawing conclusions from available existing research.

No significant cost differences between 900MHz and 2100MHz

74. As regards Ofcom's analysis of site requirements, and savings versus using 2100MHz spectrum, Ofcom carried out some propagation measurements in Camden, North London and from these they extrapolated the number of cells needed to cover 80% of the UK population using a UMTS2100 network. In so doing, Ofcom generate a significant over-estimate of the costs of such a network arriving at between 13,900 and 29,000 sites required (depending on the demand scenario) versus O2 and other industry estimates of between 7,400 and 11,000 sites.
75. Ofcom further assume blanket coverage of a quality to achieve high in-building penetration, which, in O2's view, is unrealistic and inefficient. An efficient operator would target its coverage to achieve optimum in-building coverage depending on local circumstances (for example, clutter and building type etc.). Using that approach would further reduce the number of required sites to between 7,400 and 8,500 depending on the demand scenario.
76. Ofcom assume that the current 2100MHz networks would need to be upgraded to deliver quality in-building coverage in the medium demand scenario. O2 believes that in fact current UMTS2100 networks are already of sufficient quality to deliver this level of service to customers. Ofcom will be aware from O2's submissions in response to previous information requests that its network is built to a design threshold that provides in-building coverage. Our own surveys of other operator networks suggest that this is not an uncommon practice.
77. The result is that, in the Consultation, Ofcom have significantly overestimated the number of cells required to build a UMTS2100 network of equivalent quality to a new UMTS900 network re-using existing sites.
78. Finally, the network design proposed by Ofcom, whereby UMTS2100 is used for outdoor coverage and UMTS900 for in-building coverage, is again, in O2's view, unrealistic. Such a design would result in an unacceptable amount of handover between carriers and lead to poor quality for customers. Efficient network designs will require multiple carriers available in-building to deliver multiple services to devices (for example, HSPA on one carrier, voice on another, MBMS on another etc). Consequently, in the future, UMTS2100 and UMTS900 coverage would be coincident.
79. **Put simply, it is more efficient to build a few more UMTS2100 cells than to refresh the equipment in an entire 900MHz network. This is the case even before the costs of clearing the heavily utilised GSM900 networks of O2 and Vodafone are considered.**
80. Even if mobile broadband did take off to an appreciable extent, it is cheaper and less risky (in terms of device availability and network disruption) to build more UMTS2100

cells than to refarm, even for 900MHz incumbents, up until the point at which a large number of customers is resident in the UMTS2100 network and there is a significant base of UMTS900 compatible devices.

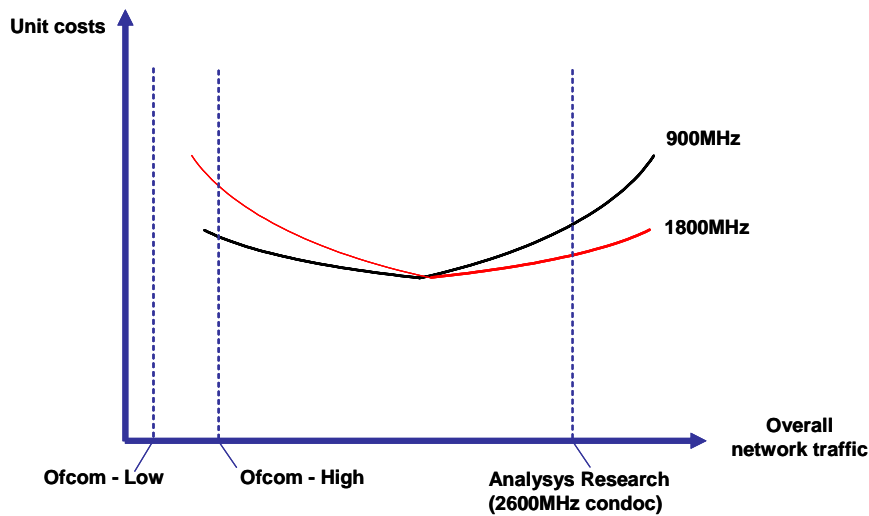
81. This would mean that the marginal benefits of refarming relate solely to an ability to reduce forward looking operating costs in the provision of mobile broadband within an established market, rather than gaining an advantaged position within a growing market and have lower capital costs to achieve coverage.
82. More detail of O2's analysis of UMTS900 and UMTS2100 cost differences is set out in **Annex A**

Costs vary with time and mobile broadband capacity

83. In **Annex B**, we show that the low scenario modelled by Ofcom is the only one supported by the research Ofcom include in their consultation. Ofcom state at paragraphs 5.26 and 5.27 of the Consultation that they need to undertake a scenario based approach to quantify cost differences. They draw up two further scenarios (medium and high) although the evidential basis for such scenarios is unclear.
84. In the high scenario, at a maximum, Ofcom predict that only 10% of users (90% of whom are indoors) are using services at 384/114k to a total of 20Mbits per day and that a further 40% of users are using mid-rate data services with the remaining 50% of users using basic voice and data services (paragraph 5.93.1 refers).
85. However, in their recent discussion document on the potential future auction of the 3G expansion band (2600MHz)²⁹ Ofcom quote much more bullish forecasts for mobile data usage in order to support their case for release of additional UMTS spectrum on the market. At A12.20 in that document, Ofcom rely on a study from Analysys Research which shows "47% of mobile subscribers in 2012 already using HSPA, with a further 44% on UMTS". This second group, Ofcom suggest "could potentially migrate to HSPA in the immediate future beyond 2012."
86. It is difficult to reconcile the demand scenarios used in the Consultation with the future demand predicted by Analysys Research, which Ofcom quote to support their proposals with regard to the award of 2600MHz. Just two years after the proposed 900MHz intervention in 2010, 91% of all mobile subscribers will be HSPA users and perhaps half of those (i.e. the early adopters) could be heavy users. **This should suggest that capacity will be the binding constraint on mobile networks at that time, not coverage.**
87. In Figure 1 below we illustrate how Ofcom's particular snapshot view in this consultation may not give a sufficiently broad perspective on which to reach sound conclusions about future cost differences.

²⁹ <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/>.

Figure 1 : Network costs curves



88. The curves are illustrative but are representative of unit costs of UMTS deployments at particular frequencies under different traffic loads. We assume that these networks are building on installed 2100MHz networks, so that Ofcom's low scenario does not justify deployment of UMTS at other frequencies and so it is effectively beyond the left hand edge of the curves.
89. Ofcom's high scenario picks up some cost differences between 900MHz and 1800/2100MHz³⁰. As capacity grows, however, the small cost differences between 900MHz and 1800MHz erode as coverage is not the limiting factor. By the time overall network capacity reaches the level predicted by Analysys Research, the cost of cell splits is the binding constraint. With less 900MHz spectrum available, the costs of 900MHz rise sharply as, per Mbit of traffic added, 900MHz operators have to perform twice as many cell splits as the 1800MHz operators. The long term and enduring "advantage" enjoyed by the 1800MHz operators results from them having nearly twice as much available spectrum as 900MHz operators. Ofcom's proposals would compound this advantage.

Risk of intervention leading to regulatory failure

90. Ofcom base their case for intervention in relation to the 900MHz spectrum on the grounds that: (i) mobile broadband demand may be high in future, though what demand there will actually be is uncertain and perhaps medium is more likely³¹; (ii) there are significant cost differences between using 900MHz and 2100MHz spectrum for mobile broadband; and (iii) coverage is the limiting factor.
91. As O2 has stated elsewhere in this Response: (i) demand for mobile broadband is uncertain and Ofcom have not carried out any new, credible market research which

³⁰ In their consultation Ofcom suggest the 2100MHz and 1800MHz costs are virtually equivalent.

³¹ Paragraph 11.31.

makes the position any clearer; (ii) there are marginal, if any, cost differences between using 900MHz and 21000MHz spectrum, according to O2's analysis; and (iii) capacity, not coverage, will be the limiting factor in future. O2 is strongly of the view, therefore, that Ofcom's proposals are unsound.

92. Without clarity on the above matters, Ofcom run a considerable risk of regulatory failure in intervening as proposed. In relation to spectrum matters, Ofcom have previously expressed the view that:

*"our strategy for spectrum is to make a major shift away from control by the regulator in favour of an approach that as far as possible **leaves to the market decisions over who may use spectrum**.....It is consistent with that strategy to start with a clear presumption in favour of adopting a **market-led approach**.....starting with this presumption is also consistent with the principles of good regulation, which require us to be transparent and proportionate in our activities, and to ensure that regulation is targeted only at cases where action is needed."³² (emphasis added)*

93. Intervening too early increases the risk of regulatory failure, when market failure may not necessarily occur:

*"Regulatory failure is in many ways the counterpart of market failure. It is the probability that a regulatory intervention does not have the outcome that was intended, because the **benefits are less than expected** and/or **the costs (static and dynamic) are larger**.*

*The probability of regulatory failure plainly depends on the nature of the intervention being considered and the circumstances faced. But **the probability is much greater where there is high uncertainty**, for the reasons discussed above.*

*The risk of regulatory failure also depends heavily on the type of intervention that is made. Some mechanisms for intervention are more prone to causing regulatory failure than others. For example the **risk is likely to be greater** where:*

- *the **intervention is large and difficult to reverse**, and/or difficult to graduate in response to changing circumstances;"³³ (emphasis added)*

94. One of Ofcom's regulatory principles states that Ofcom "will strive to ensure that our interventions are evidence-based, proportionate, consistent, accountable and transparent in both deliberation and outcome." Ofcom will also "seek the least intrusive regulatory mechanisms to achieve their policy objectives". A lack of evidence for a serious and costly intervention would make the intervention unreasonable and disproportionate.

³² *Digital Dividend Review*, paragraphs 6.11 to 6.12.

³³ *Digital Dividend Review*, paragraphs 6.58 to 6.61.

95. Ofcom state in the *Spectrum Framework Review: Implementation Plan* that "Ofcom considers that a market-based approach to spectrum management is likely to be more effective at promoting efficient use of the spectrum than an approach based on judgement by the regulator as to the optimum use of each frequency."
96. In the *Digital Dividend Review* consultation, Ofcom state that the market-led approach should be replaced by an interventionist approach only if there is likely to be some form of market failure with potentially serious consequences and the best way of responding is by imposing constraints (the benefits of intervention outweighing the costs and risks of doing so). Ofcom have not demonstrated a high likelihood of market failure, and in fact, using Ofcom's own cost/benefit values produces outcomes under which trades should take place.
97. In relation to the *Digital Dividend Review*, Ofcom identify a number of costs and risks of intervention, such as: the distortion of commercial incentives; loss of flexibility in spectrum use; adverse effects on competition and innovation; and, in particular, the high uncertainty around the effects of regulation. Arguably, all these risks are present here.
98. The same presumption in favour of a market-led approach is clear in Ofcom's consultation on *Future broadband: Policy approach to next generation access*, where Ofcom say in relation to an interventionist approach that:

"for such an approach to be justified there would have to be strong evidence that a market-based approach to investment would for some reason deliver the benefits of next generation access to society or the economy inefficiently late".

Later, Ofcom say that "any move to accelerate the deployment of next generation access networks through either regulatory or public policy intervention would require **a significant threshold in terms of the evidence** on the potential social and economic benefits". (emphasis added)

99. **Ofcom must exercise their duties in a consistent manner, and consequently O2 believes that there is still a significant analytical and evidential task for Ofcom to complete before they can clarify whether there are any potential problems to be addressed following liberalisation and whether they need to intervene in the manner currently contemplated, or at all.**

V The current proposals are disproportionate to any legitimate objective

100. Leaving aside whether Ofcom's aim of widening access to the 900MHz spectrum is in fact necessary, the following section considers why O2 believes that Ofcom's proposals, in particular their proposal in Option C to require O2 to release 2 x 7.5MHz of spectrum by 2010, are disproportionate in view of the costs to O2 and Vodafone and to society at large compared with the perceived benefits to society of widening access to the 900MHz spectrum, and in view of the significantly less intrusive alternative means available to Ofcom which would achieve the same result.

101. Ofcom can only vary or revoke O2's licence to require the release of 900MHz spectrum to the extent that their proposals are proportionate and represent a fair balance between the costs and benefits of doing so and there are no less intrusive alternative means of achieving the same objective.

Option C is not proportionate – the costs outweigh the benefits

Introduction

102. For the reasons set out below, Ofcom's current proposals are, in O2's view, disproportionate: the costs of implementing Option C are significant, releasing 2x7.5MHz (or rather clearing 2x12.5MHz when O2's own spectrum is included) by 2010 is impracticable, the benefits are uncertain and unproven, and there are losses to society and other disbenefits of which Ofcom are unaware or which Ofcom have not yet considered (many of which are certain and will be incurred by one segment of society to the benefit of another, i.e. there is also a distributional problem, see **Annex B**). There are also less intrusive alternative means of achieving the same policy objective of widening access to 900MHz spectrum.
103. Moreover, using the 900MHz spectrum would not in fact be the most efficient and effective means of delivering 3G services to consumers in the UK. As set out below, it is in fact more efficient to build a few more UMTS2100 cells than to refresh the equipment in an entire 900MHz network.
104. **Whilst Ofcom, and the Commission, in general terms³⁴, note that 900MHz has propagation characteristics which allow coverage at lower cost of large areas, and therefore offers better coverage in less densely populated and rural areas than higher frequency bands, such benefits are illusory in the UK context. [X].**
105. The rest of this Section explores these issues in more detail. In addition, **Annex A** contains an even more detailed costs analysis, and **Annex B** contains a more detailed analysis of the benefits and disbenefits of Ofcom's proposals.

Costs of implementing Option C

106. More than anything else, the requirement for O2 and Vodafone to incur vast costs, as a result of Ofcom's proposal to require O2 and Vodafone to clear and release three blocks of spectrum, makes this option disproportionate to the stated policy aim of widening access to the 900MHz spectrum. This is particularly the case given that Ofcom's policy is predicated on there being high future demand for 3G mobile broadband services, even though Ofcom admit that the demand is in fact unproven and uncertain, and the market research presented only supports the low demand scenario.

³⁴ See the background context to the Decision in the Commission's proposal to repeal the GSM Directive (COM(2007) 367 final http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/com/com2007_367_en.pdf).

107. In Ofcom's preferred scenario, where O2 and Vodafone each release 2x7.5MHz of spectrum, Ofcom estimate the costs of clearing and releasing that spectrum to be up to £770million, but Ofcom concede in paragraph 1.47 that:

"in the case of three block release the amount of spectrum available to the releasing 900 MHz operators to carry their 2G traffic would be very significantly reduced (by 1/3rd) and this would be likely to require them to undertake extensive investment in order to be able to continue to provide 2G services to their existing (and future) subscribers."

108. Ofcom's cost estimates are in fact a significant underestimate in that they do not take account of the costs incurred in clearing 2x5MHz of the retained 900MHz spectrum so that O2 and Vodafone can also use 900MHz for UMTS/3G. O2 and Vodafone will need to clear this additional spectrum if they are to be two of the five operators providing UMTS/3G services on 900MHz spectrum by 2010 as desired by Ofcom.

109. The costs of clearance calculation in Ofcom's analysis is predicated on:

- a. There being little current utilisation of EGSM by O2;
- b. The deployment of Synthesised Frequency Hopping in O2's residual GSM spectrum; and
- c. Forced migration [X] from 2G to 3G in the period 2008 to 2010, five million customers in total.

110. In **Annex A** we show that (a) is incorrect: O2 uses its EGSM spectrum extensively and Ofcom's measurements were conducted incorrectly. We show that (b) is not possible because [X].

111. In **Annex B** we show that (c) will distort retail competition and explain why it would be disproportionate to rely on this methodology to remove traffic from 2G networks. [X]

112. Notwithstanding the problems inherent in (c), O2 estimates its costs of clearing and releasing different amounts of spectrum whilst relying on forced migration of excess traffic and using the only available method of doing so (cell splitting), to be as follows:

Table 1: New 2G sites required to clear spectrum and cost of 2G mitigation – O2 only

	Sites	NPV2021 (£m)
2.5MHz	[<]	[<]
5MHz	[<]	[<]
7.5MHz	[<]	[<]
10MHz	[<]	[<]
12.5MHz	3650	1,200

Note: Sites rounded to nearest 50, NPV rounded up to nearest £50m. Social discount rate.

113. Ofcom discuss the impact of profit shocks on O2 and Vodafone from releasing spectrum (paragraphs 8.46 to 8.54 refer). Essentially Ofcom conclude that £770m is not a sufficiently large cost (in light of Telefonica SA and Vodafone PLC’s sizes) that these companies could not fund spectrum clearance by accessing the capital markets. O2 would suggest that Ofcom need to revisit this primary assumption in light of O2’s analysis that the cost³⁵ (in total for O2 and Vodafone) would in fact be £2.5 billion at a commercial WACC, with an associated [<] impacts of forced 2G to 3G migration (see **Annex B**).
114. If O2 and Vodafone can go to the capital markets to raise this sort of money they could also go to the markets and borrow this money in order to invest in customers, including, *inter alia*, lowering prices. By borrowing money to relieve congestion in their networks, O2 and Vodafone will be reducing their ability to fund price reductions to their customers. As mentioned previously, economic theory dictates that the cost of clearance will inevitably be passed on to consumers in one form or another and is thus a cost to society. Therefore, Ofcom must include the cost of clearance as a loss to society in any robust cost/benefit analysis.
115. The reliance on forced 2G to 3G migration will also incur costs, although as this will be in the form of cheaper tariffs to consumers in order to persuade them to migrate, those costs may not be, directly, losses to society as a whole. In **Annex B**, O2 shows that Ofcom’s assumptions about handset subsidies are incorrect and that tariff reductions are the only viable method to migrate customers to the degree required. The effect of this is to reduce prices across the market and consequently lower the available profits for re-investment in the industry. O2 estimates that the available pool of future investment funds will be reduced by £9 billion.
116. In summary, Ofcom have suggested that O2 could increase the handset subsidy for 3G devices. However, given that most handsets are now free on connection or on re-sign to a further minimum contractual term, it is hard to see how an operator could provide

³⁵ Cell splitting costs plus handset subsidy for forced 2G to 3G migration.

further incentives in the form of cheaper handsets. Notwithstanding this, in order to compete in the market O2/Vodafone would incur an upfront cost of approximately £75 per customer just to achieve price parity with its competitors' free 2G devices. With 10 million customers to move at £75 per handset, O2 and Vodafone would together incur £750 million in handset subsidies.

117. As regards the new 2G sites which would be required to clear spectrum (Table 1 above), if Ofcom claim efficiency gains, in the form of fewer UMTS2100 mast sites, then they must also account for the 7,000 additional masts required by O2 and Vodafone to support the residual GSM networks.
118. In addition, at the higher levels of spectrum release it is highly unlikely that the number of additional sites that would be required could be found in the target urban areas. In Central London, for example, if Ofcom's proposals are adopted, there will be less than 200m between sites [3<].
119. Further detail on O2's analysis of the costs of implementing Option C can be found in **Annex A**.

Benefits

120. In summary, O2's calculation of the benefits is as follows:

Table 2: Benefits

Market scenario	Ofcom's NVP2021 (£m)	O2's NVP2021 (£m)
Low <i>difference</i>	331	(542)
Medium <i>difference</i>	766	25
High <i>difference</i>	2,000	71

Disbenefits

121. Ofcom assume that the benefits are additive for every network deployed at 900MHz, i.e. for every network installed 100% of the cost savings are achieved. This is incorrect. The efficient level of investment is constrained by the size of the incremental profits available from mobile broadband (whether at 900MHz or 2100MHz), such that investors make a return on their cost of capital. Any over-investment beyond this point will be wasted and inefficient³⁶.

³⁶ It would appear that Ofcom are now in agreement with this. In their recent Statement on the licence variation for UK Broadband http://www.ofcom.org.uk/consult/condocs/bb_application/statement/ Ofcom say at paragraph 3.57 "We consider, in line with recent academic economic literature, that the merits for investment are likely to be assessed on the basis of the difference in profits with and without investments". This would accord with the network rollout model used by O2 and described at Annex A. Therefore, in this case, Ofcom must consider the efficient level of investment for operators, such that profits are not diluted by superfluous infrastructure.

122. O2 has attempted to estimate the efficient level of investment. In order to undertake this analysis, O2 assumes that 15% of revenues are accrued by covering the last 20% of the UK. The relative likelihood of national coverage of UMTS900 incremental investments is also considered.

Table 3: Efficient number of UMTS900 networks in the High scenario

NPV 2021 at commercial WACC (£m)	Core
Revenues	810 (derived from Ofcom's market research)
Costs of UMTS900 (O2 analysis)	(350)
"whole networks" that provide a return on the cost of capital	2.31

123. If the costs and benefits of UMTS900 are to be correctly assessed, they will have to account for the efficient investment level, which in this case is 2.31x. The cap on investment created by the size of future revenues will express itself as a restriction on the average level of infrastructure investment per operator.
124. Therefore, based on Table 3 and Table 2 the maximum value of benefits that are achievable is $2.31 \times \text{£71m NPV}_{2021} = \text{£164m NPV}_{2021}$.
125. In light of the unlikely investment in rural UMTS900 before GSM end of life, O2 does not address these costs in its further evaluation of Ofcom's analysis. However, in light of the large externality identified in Ofcom's *Digital Dividend Review* research there appears to be a compelling case for HM Treasury to incentivise rollout to rural areas. O2 looks forward to Ofcom's proposals in this regard in due course.

Financial cost/benefit analysis

126. The following table shows a "balance sheet" of costs and benefits to society of Ofcom's Option C under varying degrees of spectrum clearance. It should be noted that this does not factor in the limitations on the achievable spectrum clearance caused by spectrum exhaustion. It is therefore simply illustrative of the approach that Ofcom should adopt when evaluating the societal gains (or losses, in O2's view) of their intervention.

Table 4: Social value balance sheet (all values in £m NPV2021), based on 2010 date³⁷

	Clearance costs per network ³⁸	Benefits per network ³⁹	Net social value
O2/VF REFARM	∞	(1084) - 140	(∞) – (∞)
O2/VF REFARM AND RELEASE 2X5MHZ	∞	(1252) - 164 ⁴⁰	(∞) – (∞)
O2/VF REFARM AND RELEASE 2X10MHZ	∞	(1252) - 164	(∞) – (∞)

127. Again, these costs will be borne by all in society rather than the lucky few “high quality” mobile broadband users.
128. Further detail on O2’s analysis of the benefits and disbenefits of implementing Option C can be found in **Annex B**.

Environmental/efficiency cost benefit analysis

129. Ofcom note their environmental concerns in the press release accompanying the Consultation:

“In particular, future 3G services rolled out using 900MHz would require far fewer mobile phone masts than if higher frequencies were used. It would be possible to build a high quality mobile broadband network covering 99 per cent of population using around 10,000 fewer sites per operator.”

130. O2 shows in this Response that there is unlikely to be a UMTS900 deployment by any player in rural areas, as there is no payback on the investment purely on the back of mobile broadband (the basis for Ofcom’s intervention). We are unlikely to see any UMTS2100 build there either. Ofcom cannot claim these “avoided sites” within the environmental benefits. We are left, therefore, to examine the avoided UMTS2100 sites in the “core area”, not forgetting of course the sites required for GSM900 in order to offset some (although not all, because of spectrum exhaustion) of the capacity loss.

Table 5: Environmental balance sheet of estimated number of sites required

³⁷ [∞]

³⁸ Table 1 refers, other costs not included.

³⁹ Table 2 refers.

⁴⁰ Benefits capped at 2.31x per network value.

	Ofcom	O2 Blanket coverage
UMTS2100 sites in "High" Scenario	29,000	11,000
Assumed sites in 2010	6,500	7,400
Delta	22,500	3,600
Reused existing @85%	19,125	3,060
New sites required per operator	3,375	540
Sites required for clearance	Nil	7,000
Avoided sites at max. investment level	7,810	(5,750)

131. There would therefore appear to be a substantive disbenefit to citizens from Ofcom's intervention.

Less intrusive alternative means of widening access to 900MHz spectrum

132. It would not be proportionate for Ofcom to adopt a highly interventionist approach where there are less intrusive alternative means which could achieve the same outcome.
133. There is a wide gap between what Ofcom are suggesting in Options A and B of the Consultation (liberalising spectrum in the hands of the incumbents and, in B, also imposing a requirement to offer regulated roaming to third parties) and Options C and D (requiring all or some of the spectrum to be released).
134. However, there are a number of less intrusive means not fully explored by Ofcom by which Ofcom could achieve the overall policy aim of widening access to 900MHz spectrum. In O2's view, a "wait and see" approach alongside trading and commercial roaming would be the most appropriate less intrusive alternative means in this case:

Trading

135. As discussed above, Ofcom could implement Option A for 900MHz just as they have proposed for 1800MHz and wait and see if trading takes place. If trading has not occurred by a given date in the future, Ofcom could re-evaluate the evidence and at that time to determine whether trading should have happened in light of the costs and benefits to buyers and sellers at that time. Ofcom could then subsequently require spectrum to be released and redistributed if the lack of trading was having a demonstrable detrimental impact on competition.
136. Spectrum trading has significant societal benefits in relation to spectrum redistribution. The appetite of purchasers does not have to be assumed by Ofcom (unlike in Option C),

the process is dynamic (unlike Option C, where an irrevocable decision is required) and the costs of clearance can be recovered by the party which incurs those costs, via the price paid for spectrum.

137. Ofcom's analysis of the prospects for trading in the Consultation is unreliable, because it uses explicit or implicit assumptions which do not fit the characteristics of the UK mobile market. O2 is advised by Oxera that Ofcom have relied just on academic literature rather than focusing on the specifics of this situation.
138. At **Annex C** we present a report commissioned by O2 to review Ofcom's analysis of spectrum trading and strategic interactions. Oxera's model predicts that a stable outcome in which additional operators gain access to 900MHz spectrum through the trading market will occur when potential buyers of 900MHz spectrum are already active in the market providing 3G services. In this case, the competitive impact on the seller of any trades is relatively small, compared to the potential profits to the buyer – the buyer's willingness to pay for spectrum is therefore sufficiently high to compensate the seller for the loss in profits it would experience.
139. When clearance costs are incorporated in the analysis, Oxera's model predicts that the trading outcome described above is sustainable, particularly when demand for mobile broadband and cost differences between 900MHz and 2100MHz spectrum are relatively high. In these cases, provided clearance costs are not too high, the trading market can be relied upon to achieve a wider distribution of 900MHz spectrum and regulatory intervention is not warranted.
140. The cases where Oxera's model predicts that trades are unlikely to take place are characterised by low demand for mobile broadband, small cost differences between 900MHz and 2100MHz 3G networks and/or very large clearance costs. In these cases, however, regulatory intervention of any sort would not be proportionate given the very large and certain costs for society compared with the small and very uncertain benefits.
141. **This is the situation to 2010 foreseen by O2's analysis. Beyond 2010, O2 believes that there may be a gradual reduction in traffic on its 2G network such that clearance costs decline with time and circumstances may be more conducive to trading. However, as we state elsewhere, by that time it is likely that capacity will be the binding constraint on 3G networks, such that the cost advantage may rest with T-Mobile and Orange.**
142. Ofcom omit to consider the impact on decision-making by licensees of a strong signal from a regulatory authority about undesirable outcomes in the market and the threat of enforcement action. Such a signal would further enhance the functioning of the market.
143. [X]
144. [X]

Commercially negotiated roaming

145. Oxera's analysis in Annex C shows that, as with trading, commercial roaming offers will be available on the market provided roaming seekers are already active in the market. Moreover, the likelihood of a commercial roaming solution occurring is higher than for trading – through the provision of roaming, holders of 900MHz spectrum avoid large upfront clearance costs and can achieve economies of scale by increasing the usage of their networks.

Intervention at a later date

146. A key way to avoid a disproportionate effect would be for Ofcom to adopt a "wait and see" approach, which would entail Ofcom liberalising and making tradable both the 900MHz and the 1800MHz licences in, say, 2009, and waiting to see how the market develops. This would allow Ofcom to better understand, in particular, how UMTS900 is deployed and whether;
- a. capacity or coverage are the binding constraints on 3G networks; and
 - b. there has been an impact on competition or concentration of either 1800MHz or 900MHz holdings as a result of (a).

147. The issue of later intervention is discussed further in **Section VII** below.

Conclusions on proportionality

148. As set out above, for a measure to be proportionate, it must be no more than what is appropriate and necessary to achieve the relevant objective and, where there is a choice between several appropriate measures, the least onerous measure must be used.

149. **In O2's view, Ofcom's proposals are disproportionate for the following reasons:**

- a. **The costs of releasing the 900MHz spectrum will be significant and will not result in a more efficient outcome than simply building a few more UMTS2100 cells;**
- b. **The costs will be borne by O2 and Vodafone and also by society, in that they could otherwise have been invested in new services or used to fund lower prices;**
- c. **O2 has already achieved all of the efficiency gains assumed by Ofcom, [X], cell splitting is the only option, which will harm citizens' interests;**
- d. **The cost differential between 2100MHz and 900MHz deployment is marginal if not negative;**
- e. **900MHz coverage benefits are illusory and theoretical, so there is no competitive advantage to O2 and Vodafone of being the only users of the spectrum;**

- f. **There are less intrusive alternative means, for example trading and commercially negotiated roaming, by which Ofcom's policy aim of widening access to 900MHz spectrum could be achieved;**
- g. **Intervention at a later date by adopting a "wait and see" approach would avoid a disproportionate effect.**

VI Current proposals would distort rather than promote competition

- 150. Ofcom have a duty to ensure that there is no distortion of competition and a duty to encourage efficient investment in infrastructure and efficient use of radio spectrum. Ofcom also have a duty to further the interests of consumers in relevant markets, where appropriate by promoting competition, and to act in a non-discriminatory manner.
- 151. In O2's view, Ofcom's proposals would have the opposite effect and would in fact result in a distortion of competition in today's market for mobile services with unintended and negative consequences for consumers, particularly those in lower income brackets relying on cheaper 2G service offerings. Both the effects on O2's 2G network and the enormous costs O2 is expected to incur in releasing 900MHz spectrum will have a significant impact on O2's ability to compete.
- 152. The rest of this Section considers these issues in more detail.

Existing state of competition in the retail market for mobile services

- 153. The retail market is very competitive and there is no market failure or other competition problem which Ofcom need to address by intervening in the market today. Given that the market is very competitive, Ofcom should be slow to intervene based on pure speculation about the future.
- 154. Ofcom talk in various places in the Consultation about the need to ensure that there is no reduction in competition "*in the mobile market*"⁴¹. In others, they specifically refer to competition in the provision of "*mobile broadband services*"⁴² being less intense if Option A is followed for the 900MHz spectrum. Both of these concerns relate to future possibilities for the market (or markets) as they might then be and do not relate to the market as it is today.
- 155. The market for mobile broadband services is very much a nascent market. The European Commission's guidelines on market analysis points to the risks in regulating emerging or nascent markets such as mobile broadband and point to the possibility of reassessing the market at a later stage:

“premature imposition of ex-ante regulation may unduly influence the competitive conditions taking shape within a new and emerging market. At the same time,

⁴¹ For example, paragraph 1.27 of the Consultation.

⁴² Paragraph 8.14 of the Consultation.

*foreclosure of such emerging markets by the leading undertaking should be prevented. Without prejudice to the appropriateness of intervention by the competition authorities in individual cases, **NRAs should ensure that they can fully justify any form of early, ex-ante intervention in an emerging market, in particular since they retain the ability to intervene at a later stage, in the context of the periodic re-assessment of the relevant markets.***⁴³ (emphasis added)

156. O2 notes that where Ofcom have in the past carried out market reviews and found SMP in cases where a market was still emerging, they chose to place only minimal obligations on the player with SMP. O2 believes that the market for mobile broadband services, including services which will use the 900MHz and 1800MHz liberalised spectrum, is nascent if not an unknown quantity. O2 is strongly of the view that, on the basis of Ofcom's past approach in relation to such markets, Ofcom should adopt a "wait and see" approach in light of the significant risk of regulatory failure.

Effect of the proposals on competition

Requirement to act in a non-discriminatory manner

157. Pursuant to their duties under the Framework Directive and the Act, Ofcom are required, when exercising their spectrum management powers, to do so based on objective, transparent, non-discriminatory and proportionate criteria and to do so impartially. Ofcom also have a duty to take the utmost account of the desirability of making regulations technology neutral and of carrying out their functions in a manner which does not favour one form of electronic communications network or service over another⁴⁴.
158. **By not considering a broader and more long term range of future mobile broadband scenarios, Ofcom arrive at a decision that focuses on just the 900MHz operators and does not consider longer term advantages accrued by 1800MHz operators, namely in terms of the capacity and speed advantages conferred on the 1800MHz operators and the capacity disadvantages for the 900MHz operators with fragmented and less spectrum. Ofcom's proposals therefore discriminate against O2 and Vodafone.**
159. The significant costs of clearance can be expected to have a detrimental impact on O2's ability to carry out planned research and development, to innovate and to compete in the market.

The effect of concentration of spectrum holdings on future competition

⁴³ Commission guidelines §32

⁴⁴ This wording would indicate that Ofcom should not favour 2G/GSM over 3G/UMTS or favour 900MHz services over 1800MHz services, but probably does not mean that Ofcom, at least here, is being required not to favour Orange and T-Mobile over O2 and Vodafone.

160. Article 3(3) of the RSC Decision provides for further technologies to be deployed in the 900MHz and 1800MHz bands, including UMTS long term evolution or LTE. LTE can achieve very high data rates with large carrier bandwidths. If Ofcom's proposals were to be implemented, Orange and T-Mobile would enjoy large contiguous blocks of spectrum at 1800MHz allowing for an efficient deployment of LTE. In contrast, O2 and Vodafone will have a radically reduced and fragmented capacity available to them.
161. If Ofcom believe that concentration of spectrum holdings naturally leads to a potential future competition problems such as supernormal profit taking then, by extension, they must consider that a concentration of contiguous 1800MHz spectrum would create a competition problem for LTE.
162. Even if we ignore the speed advantage enjoyed by Orange and T-Mobile in relation to LTE, we note that by not considering capacity as the binding constraint on O2, Ofcom fail to prevent concentration of a large capacity advantage with Orange and T-Mobile.
163. O2 notes in this regard that Orange and T-Mobile benefit from large contiguous 1800MHz assignments, precisely because they do not currently have access to 900MHz spectrum. If Ofcom push through an intervention with respect to 900MHz such that Orange and T-Mobile have access to this spectrum, Ofcom would need to consider unwinding their historical position with regard to capacity at 1800MHz.

The effect of spectrum release on network quality and competitiveness

164. We note that at paragraph 5.23 of the Consultation Ofcom highlight that network quality is the second non-price reason for consumers choosing a particular 2G mobile network. O2 has looked at the experience of [redacted] determine the impact of:
- a. Small spectrum assignments; and
 - b. High traffic; and
 - c. High level of spectrum re-use; on
 - d. Call quality achieved for consumers; and
 - e. Compared this with the level of quality we measure in today's highly competitive 2G market.

165. [redacted]

166. [redacted]

167. [redacted]

168. [redacted]

The effect of 2G capacity constraints on competition in the 2G market

169. Ofcom have failed to consider fully the implications of [X].
170. Therefore, O2 and Vodafone would not be [X].
171. O2 does not accept Ofcom's hypothesis at paragraphs 6.16 to 6.23 of the Consultation that concentration of 900MHz spectrum holdings naturally leads to a "lessening of competitive intensity" or supernormal profit taking. However, if Ofcom is to rely on such a speculative competition finding then it must apply a similar level of caution and rigor to its assessment of the competitive impact on 2G networks caused by its own intervention.
172. **Ofcom must assess the impact on competition in today's much more important 2G market (especially pre-pay). If O2 and Vodafone were [X], T-Mobile and Orange would not compete as fiercely as they do today, there would be supernormal profit taking, by Ofcom's analysis. Worse still, that would take place at the cost of those in society which Ofcom should be seeking to protect.**

Effect of the proposals on consumers

173. Ofcom have a duty to further the interests of consumers in relevant markets, where appropriate by promoting competition.
174. Ofcom's exercise of their spectrum management powers has to be reasonable and proportionate, and proceeding on the basis of a speculative and rudimentary assessment of the effects on consumers and on the retail market would be disproportionate.
175. Ofcom say that liberalisation will lead to significant benefits for consumers in terms of improvement in the quality of 3G networks and extension of UMTS/3G into rural areas⁴⁵, yet concede that growth in demand is uncertain (although that does not prevent them assuming a medium demand scenario is more likely⁴⁶).
176. Whilst Ofcom are keen to stress the pro-consumer and pro-competition benefits of their proposals, in O2's view, they do not consider in sufficient detail whether their proposals might have any negative effects on competition or consumers, particularly in relation to the market for 2G services for which there is proven and continuing consumer demand.
177. In particular, Ofcom's proposals to require O2 to release spectrum and to deny O2 the chance to bid in an auction of the released spectrum will impact negatively on consumers by:
- a. Constraining O2's capacity to provide 2G services (both on a day-to-day basis and in the event of an emergency) - services for which there is proven consumer demand;

⁴⁵ Paragraph 1.21 of the Consultation.

⁴⁶ Paragraph 11.31 of the Consultation.

- b. Causing transitional disruption to O2 customers (which Ofcom recognise) and, [redacted];
 - c. Preventing O2 from following a 2G strategy and forcing it to change commercial direction and migrate its customers to UMTS/3G to deal with the capacity constraint, whether they want to receive 3G services or not;
 - d. Distorting the retail market for 3G services by obliging O2 and Vodafone to offer uncommercial incentives in order to move consumers to UMTS/3G;
 - e. Distorting the market for mobile devices by increasing demand for 3G devices, of which there are only a limited number of expensive alternatives, and decreasing the demand for 2G devices, of which there are numerous models at a variety of different price points (which consumers prefer);
 - f. Preventing O2 from offering cheaper chip/SIM-only deals to consumers, which are popular [redacted] and also mean fewer mobile devices being upgraded and old handsets discarded (which also has a specific cost to O2 in terms of complying with the WEEE Regulations 2006, as well as a more general environmental cost);
 - g. [redacted]; and
 - h. Inflating usage of 3G services, which entail higher subscriber acquisition costs (SAC) and more expensive devices, so manipulating the market to favour 3G services would increase costs for both operators and consumers⁴⁷.
178. Ofcom's own market research suggests that the main beneficiaries of marginally lower mobile broadband prices will be AB males, on high value post-pay contracts. By contrast, the costs of intervention (in terms of higher prices and less competition) will be felt by the vast majority of UK consumers with 2G pre-pay packages who will pick up the costs of intervention through increased charges.
179. The beneficiaries are generally those best served by competitive processes and it is normally Ofcom's role to protect the interests of lower value customers. The distributional impact is even more evident from Ofcom's own research⁴⁸, which shows that 21% of social group DE (which are a significant proportion of the 2G pre-pay segment) are solely reliant on mobile services for their communications.

⁴⁷ Ofcom should be especially cautious of this outcome given the Competition Commission's view that "competition among the MNOs to attract and sign up subscribers to their networks is vigorous. Moreover, a range of retailers compete to sign up customers. However, in our view, the nature of the competition between the MNOs at the access level, involving the subsidization of customer acquisition, has led to a structure of retail incentives that leads to a higher degree of churn between networks and a lower level of call activity by consumers than would otherwise have been the case." See : http://www.ofcom.org.uk/static/archive/oftel/publications/mobile/ctm_2003/ctm1.pdf. The Commission is of the view that high SAC and competition based on handset subsidy has taken place at the expense of increased calling on mobile networks (ie lower call prices) and consequent improvements in productive efficiency.

⁴⁸ *The Consumer Experience* – 20 November 2007; Figure 18, p.18

180. In light of all of the above, Ofcom have not, in O2's view, given adequate consideration to the potential negative effects of their proposals both on competition and, in particular here, on consumers, nor have they considered adequately the unintended consequences of their proposals. Ofcom have simply focused on the perceived competition benefits for the few.
181. Ofcom say they do not want to micro-manage markets and recently stated that they consider "*that a market-based approach to spectrum management is likely to be more effective at promoting efficient use of the spectrum than an approach based on judgement by the regulator as to the optimum use of each frequency.*"⁴⁹
182. Moreover, the retail market, certainly in respect of 2G, is very competitive and there is no market failure or other competition problem which Ofcom need to address by intervening in the market.
183. A further danger in Ofcom engineering what the market will look like is that Ofcom are necessarily basing their predictions for the future on what the current model for mobile services is today, when tomorrow's model may look very different⁵⁰. The question is more complex than simply whether there will be a demand for mobile broadband in future. New examples of non-network competition may appear, as they have in relation to fixed networks.
184. The liberalisation of the 900MHz and 1800MHz spectrum is clearly a market intervention in itself and will have an impact on the provision of 3G services. However, rather than predicting what that impact will be and taking pre-emptive regulatory action on the basis of that prediction, which could risk interfering in how the market is working at present (perfectly well) and how it might naturally develop in future, Ofcom should save any intervention for a later date when the market has readjusted to the effect of liberalisation and it becomes clear whether or not intervention is still necessary.
185. There seems little justification for Ofcom taking the interventionist and potentially market-distorting approach they are currently planning to take and before the market has had time to readjust. Ofcom's timetable should be consistent with not distorting the marketplace.
186. **In summary, Ofcom's proposals risk distorting competition in the retail market both in terms of competition as between O2 and Vodafone and Orange and T-Mobile, and competition in the form of MVNOs like Tesco Mobile offering cheaper basic 2G deals to consumers, as well as competition in the related retail market for mobile devices. Consumers will be worse off in terms of the effects on the 2G services they currently enjoy (including chip/SIM-only services, which may no longer be available, cheaper MVNO basic 2G services and cheaper handsets). These**

⁴⁹ <http://www.ofcom.org.uk/consult/condocs/sfrip/sfip/sfr-plan.pdf>, paragraph 9.18.

⁵⁰ Ofcom will soon be launching a review of the mobile market to address, amongst other things, how do define the mobile market going forwards. Ofcom will need to have regard to the outcome of that study in order to reach consistent conclusions on market definition.

detrimental effects on competition and consumers definitely outweigh the very uncertain benefits of requiring spectrum release.

Insufficient review by Ofcom of the effect of the proposals on competition

187. Given the significant and radical intervention in the market that Ofcom propose, their decision to intervene should be based on a thorough competition assessment, and the most appropriate model for such an assessment would be that normally undertaken in a proper market review.
188. Any intervention made without carrying out a very full analysis of the effect of Ofcom's proposals on competition would, in O2's view, be unreasonable and disproportionate. Ofcom should therefore not proceed before such an analysis is carried out.
189. The requirement to undertake a robust procedure is vitally important as Ofcom are proposing to implement a structural remedy on a market which they have, to date, found to be effectively competitive. Furthermore, the proposed remedy will distort retail competition in that market, both in the short and the long term.
190. O2 is strongly of the view that the regulatory uncertainty induced by a highly speculative analysis of competition in the market will dampen the appetite for investment in the sector, just when Ofcom are suggesting that more investment (in UMTS900) is required.
191. Ofcom must undertake a thorough and a wide-ranging analysis of the economic characteristics of the relevant market before coming to a conclusion.

Conclusions on the effects on competition

192. Ofcom have a duty to ensure that there is no distortion of competition and a duty to encourage efficient investment in infrastructure and efficient use of radio spectrum. Ofcom also have a duty to further the interests of consumers in relevant markets, where appropriate by promoting competition.
193. **The current analysis of the effects of Ofcom's proposals on competition and on consumers is inadequate. In O2's view, Ofcom's proposals distort rather than promote competition for the following reasons:**
 - a. **The impact on O2's 2G network and the enormous costs O2 is expected to incur in releasing 900MHz spectrum will have a significant impact on O2's ability to compete;**
 - b. **The retail market is very competitive and there is no market failure or other competition problem which Ofcom need to address by intervening in the market;**
 - c. **Orange and T-Mobile will retain all their existing 1800MHz spectrum and, by Ofcom not considering all possible future mobile broadband scenarios sufficiently, may enjoy a capacity and speed advantages that would require further intervention by Ofcom if Ofcom were to act consistently;**

- d. Users of auctioned 900MHz spectrum will be at an advantage when compared with the incumbent licensees as Ofcom are offering new licences with minimum 15 year terms (thereafter indefinite), whereas O2's licence could potentially be for only five years;
- e. Consumers will be worse off in terms of the effects on the 2G services they currently enjoy (including chip/SIM-only services, which may no longer be available, cheaper MVNO basic 2G services and cheaper handsets);
- f. Based on the incremental revenues and the cost of network build, five operators using 900MHz spectrum is unsustainable.

VII Timing

194. The longer the time allowed for the market to adjust to O2 and Vodafone's (and others') 2G licences being liberalised and the spectrum being tradable, the less intrusive Ofcom's proposals would be and the less likely it is that Ofcom would be acting disproportionately and in breach of its duties.

195. The following considers why it is essential that Ofcom adopt a "wait and see" approach in order to avoid the very detrimental effects on competition and the market which the significant regulatory intervention proposed by Ofcom would, in O2's view, be likely to cause.

Practicalities of clearing spectrum for release

196. Ofcom's own estimates as to the time taken to migrate customers and release spectrum, in the context of the length of notice periods, suggest that it could take five years⁵¹. O2 would agree that significant time is needed to clear spectrum, with the time required increasing with the amount to be released.

197. [X]

198. [X]

⁵¹ In the November 2003 *Spectrum Trading Consultation*, Ofcom state that:

"6.6.4 Although the exact notice period may need to be determined on a case by case basis, Ofcom proposes that a **standard notice period of five years would be applied in licence classes where tradability is introduced**. Ofcom believes that this approach broadly reflects current practice, both where licences are annually renewable and where licences continue subject to notice periods. It reflects, among other things, typical equipment lives and **requirements for migration of affected users**." (emphasis added)

In the follow-up *Statement on Spectrum Trading: Implementation in 2004 and beyond* (August 2004):

"6.5 Ofcom has considered the comments made by respondents and **remains of the view that 5 years is an appropriate minimum notice period for revocation of existing non-auctioned licences for spectrum management reasons**. This, together with the need for any such revocation decision to be objectively justified, should, we believe, **give adequate security to licensees** to encourage efficient use of spectrum and promote investment and innovation, while at the same time **giving Ofcom the ability to recover spectrum if necessary for spectrum management reasons** (...)." (emphasis added)

199. In relation to Ofcom's proposals that O2 should release 2x7.5MHz of 900MHz spectrum, this is, as might be expected, totally impracticable and could only be achieved at enormous cost to O2 and [redacted]. Clearing the spectrum would also involve forced migration of O2 customers to 3G services and [redacted].
200. The task of clearing spectrum is exacerbated by the fact that Ofcom are proposing that clearance takes place by 2010 and by the fact that O2 would in fact have to clear 2x12.5MHz of spectrum (to include clearance of sufficient spectrum to allow O2 itself to refarm on 900MHz spectrum). Moreover, O2 are already [redacted].
201. It is clear from O2's analysis of the cost of clearance that even for incumbent 900MHz holders to implement UMTS900 is a significant financial and logistical undertaking. If O2 were to refarm in 2010, as suggested by Ofcom, even without spectrum release to others, O2's 2G network would [redacted].
202. In light of this limiting factor, clearance of 2x5MHz (i.e. for O2's own use) is not possible before 2010 (as proposed by Ofcom) and may not happen much before [redacted].
203. Given the serious practical difficulties O2 would face in clearing any spectrum by 2010 as Ofcom propose, it is, in O2's view, unreasonable to require O2 to do so when they clearly cannot and where Ofcom themselves acknowledge that such an exercise usually takes two to three times as long as Ofcom have allowed.

Ofcom must have regard to the circumstances of individual operators

204. O2 has been at the forefront of price competition in the UK market in recent years. It has made very large investments in its 2G network in order to provide cheap voice calls to its customers.
205. As a consequence, not only has it outperformed the market in terms of revenue and profit growth, but its network is also highly utilised when compared to its peers. [redacted]
206. [redacted]. Ofcom will need to have regard to the individual circumstances of the various 2G operators if it is to make a proportionate and non-discriminatory decision, especially in light of the benefits that UK consumers have derived from the strategy adopted by O2 to date.

Necessity for the "wait and see" approach

207. At present, Ofcom are proposing that spectrum be released in 2010. This is notwithstanding Ofcom's earlier comments on implementation that, because of the disruption caused by their proposals, more time than six months to three years would be needed to migrate customers off the spectrum to be released⁵².

⁵² Paragraph 3.13.3 of the Consultation.

208. A delay would have the additional benefit of allowing the market for 3G services to develop further and for a clearer picture to emerge of what consumer demand there actually is for 3G/mobile broadband services and what other services (e.g. WiFi) might be substitutable, meaning that Ofcom's proposals would be less of an experiment and Ofcom would have a more reliable basis on which to make policy decisions.
209. **A delay in evaluating the need for a release of spectrum, whilst in the meantime liberalising the spectrum and enabling tradability, would also allow time to see whether trading does take place and redistributes the spectrum to a sufficient degree so that access to 900MHz or 1800MHz spectrum is widened, should this be desirable. In the event that this does not occur, Ofcom have numerous means by which they can subsequently require spectrum to be released and redistributed.**
210. As far as demand for suitable spectrum is concerned, delaying until 2012 would also enable Ofcom to make a decision on O2's spectrum with the additional knowledge of what is intended internationally for the digital dividend spectrum released in 2012. If some of it could be used for mobile broadband, there would be no need to claw back O2's spectrum.
211. Ofcom have argued that delaying the timetable would result in a corresponding reduction in consumer benefits. However, as those benefits are unproven and uncertain, given the rather more certain and significant impact on the costs which will be incurred in trying to achieve spectrum release by 2010, requiring those costs to be incurred would be disproportionate. Even Ofcom recognise that growth in demand is uncertain while costs relating to spectrum release are much more certain⁵³.
212. Finally, the "wait and see" approach has the additional benefit of being less likely to constitute a breach by Ofcom of their duty to act proportionately and not to distort competition, and is therefore [X<].

VIII Proposed auction of released 900MHz spectrum

213. Ofcom must, in carrying out functions such as auctions and awards of licences, secure the optimal use of the spectrum and act reasonably and rationally, and in a proportionate, non-discriminatory and transparent manner.
214. Ofcom are entitled to set rules for the auction of spectrum, but must not set rules which are discriminatory or disproportionate. Ofcom propose to preclude participation in any auction by O2 and Vodafone because it would frustrate the objective of the intervention.
215. O2 has shown that the basis for intervention is flawed. It is based on a series of linked hypotheses which may not necessarily be true at the time of any auction, primarily:
- a. That 900MHz confers cost and competitive advantages; and

⁵³ Paragraph 11.39 of the Consultation.

- b. That there should be five players using 900MHz in 2010.
216. However, O2 has demonstrated that, by 2010, the rationale for intervention will have fallen away and there will be no cost advantages or competitive distortion, particularly if capacity becomes the limiting factor. Accordingly, given that the consequence of Ofcom's proposed release of 900MHz spectrum would be to remove any ability of O2 and Vodafone to refarm, then in order not to discriminate against O2 and Vodafone, they must be given the opportunity to access UMTS900 in 2010.
217. As discussed above, it would also be disproportionate to exclude some players from the auction on the basis that their participation might reduce competition, without having carried out a thorough competition assessment.
218. If O2 can make the most efficient use of the 900MHz spectrum, then Ofcom should allow O2 to bid accordingly and to use that spectrum if it wins the auction. O2 should also be able to acquire 900MHz spectrum from the winning bidders without that acquisition being subject to a competition review⁵⁴.
219. Ofcom would need to show, at the time of the auction, that their objective justification at the time of any decision to revoke part of O2 and/or Vodafone's licences was still justified as proportionate and non-discriminatory.
220. If it subsequently transpired that any party (other than O2 or Vodafone) used the released 900MHz spectrum for GSM, it would rather defeat the objective justification for the intervention. Therefore, in order to be consistent, if the eventual owner were not O2 or Vodafone, that owner must be restricted to deploying UMTS900⁵⁵.

IX Other issues

221. This Section sets out further issues relating to the Consultation.

Environmental impact

Unpopular changes to planning rules will be required

222. At the higher levels of spectrum release it is highly unlikely that the number of additional sites that would be required could be found in the target urban areas. In Central London, for example, if Ofcom's proposals are adopted, there will be less than 200m between sites and O2's choice of sites and ability to negotiate competitive rentals will be significantly reduced.
223. The 6,000 – 7,000 masts that O2 estimates would be required by O2 and Vodafone in the next two years to mitigate the effects of liberalisation will place a significant strain on the

⁵⁴ Paragraph 1.68 of the Consultation.

⁵⁵ This would point to Ofcom gaining greater certainty over the likelihood of efficient UMTS900 investment (cf. GSM900), given the undesirability of such an outcome.

planning system and are likely to prompt a strong reaction from local communities around the country. To minimise any adverse social effect from the loss of coverage and capacity, primary legislation from Government will be required to fast-track the processing of O2/Vodafone planning applications.

224. Unfortunately, however, a special dispensation from Government is unlikely. The Department for Communities and Local Government is currently conducting a review into the General Permitted Development Order⁵⁶ and may remove or amend the Prior Approval process, which currently enables mobile network operators to receive a decision from local authorities for all masts under 15 metres within 56 days.
225. **A build of this nature is not feasible (by virtue of Government policy) within the two years proposed for revocation of part of O2's spectrum licence, therefore the proposed notice period is unreasonable and disproportionate.**
226. The environmental impact of O2 increasing the number of cells in its 2G network would also unduly affect citizens and will cast doubt on Ofcom's environmental credentials, as exhibited at paragraph 1.24 of the Consultation⁵⁷.

[X] and licence parity

227. [X]
228. [X]
229. Finally, O2 welcomes Ofcom's acceptance at paragraph 6.48 that "1800MHz spectrum appears to be more broadly substitutable for 2100MHz or 2.6GHz spectrum". O2 looks forward to Ofcom's forthcoming Statement on the auction of the 2.6GHz band and a consequent decision to achieve licence parity with the 2100MHz licences, in light of Ofcom's acceptance of their substitutability.⁵⁸

[X]

230. [X]
231. [X]
232. [X]

⁵⁶ The Review of Part 24 of Schedule 2 to Town and Country Planning (General Permitted Development) Order 1995 by the Department of Communities and Local Government's Planning and Electronic Communications Working Group.

⁵⁷ "Reduced environmental cost is also a benefit of liberalisation. Liberalisation reduces the number of sites that need to be built to offer high quality mobile broadband services. We estimate that deploying such services with 900 MHz spectrum is likely to significantly reduce the number of new sites needed."

⁵⁸ See O2's recent responses to the relevant consultation and recent discussion document on 2600MHz.

Network sharing

233. [✕]

234. [✕]