



## Draft determinations to resolve 0870 call termination rate disputes between BT and various operators

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Draft determination

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## Section 1

# The Draft Determination

## 1.1 Dispute between BT and those operators listed in Annex 1 to this Determination

**Determination under sections 188 and 190 of the Communications Act 2003 ('2003 Act') for resolving a dispute between British Telecommunications Plc ('BT') and those operators listed in Annex 1 to this Determination concerning the charges for 0870 call termination.**

### **WHEREAS—**

**(A)** section 188(2) of the 2003 Act provides that, where Ofcom has decided pursuant to section 186(2) of the 2003 Act that it is appropriate for it to handle the dispute, Ofcom must consider the dispute and make a determination for resolving it. The determination that Ofcom makes for resolving the dispute must be notified to the parties in accordance with section 188(7) of the 2003 Act, together with a full statement of the reasons on which the determination is based, and publish so much of its determination as (having regard, in particular, to the need to preserve commercial confidentiality) they consider appropriate to publish for bringing it to the attention of the members of the public, including to the extent that Ofcom considers pursuant to section 393(2)(a) of the 2003 Act that any such disclosure is made for the purpose of facilitating the carrying out by Ofcom of any of its functions;

**(B)** section 190 of the 2003 Act sets out the scope of Ofcom's powers in resolving a dispute which may, in accordance with section 190(2) of the 2003 Act, include—

- a)** making a declaration setting out the rights and obligations of the parties to the dispute;
- b)** giving a direction fixing the terms or conditions of transactions between the parties to the dispute;
- c)** giving a direction imposing an obligation, enforceable by the parties to the dispute, to enter into a transaction between themselves on the terms and conditions fixed by Ofcom; and
- d)** for the purpose of giving effect to a determination by Ofcom of the proper amount of a charge in respect of which amounts have been paid by one of the parties to the dispute to the other, giving a direction, enforceable by the party to whom sums are to be paid, requiring the payment of sums by way of adjustment of an underpayment or overpayment;

**(C)** on 19 April 2006, Ofcom published a statement entitled *NTS: A Way Forward*<sup>1</sup> ('the NTS Statement') which sought to repair the link between 0870 call charges and geographic call charges and to remove the regulatory support for revenue sharing on the 0870 number range. In the NTS Statement, Ofcom indicated that those changes would be introduced 18 months from the date of the conclusion of the wider Numbering Review. The Numbering Review Statement was published on 27 July 2006 and Ofcom therefore anticipated that the changes to the regime for 0870 numbers would come into effect by 1 February 2008;

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<sup>1</sup> see [http://www.ofcom.org.uk/consult/condocs/nts\\_forward/statement/statement.pdf](http://www.ofcom.org.uk/consult/condocs/nts_forward/statement/statement.pdf)

(D) on 4 May 2007, in anticipation of the changes to the regulatory regime for the 0870 number range, BT issued an Operator Charge Change Notice to, inter alia, the operators listed at Annex 1, proposing charges payable by BT for call termination on the 0870 number range with an effective date of 1 February 2008;

(E) The operators listed at Annex 1 have either failed to accept or rejected the rates proposed by BT in its Operator Charge Change Notice and, in certain cases, proposed an alternative basis for charges for call termination on the 0870 number range;

(F) on 7 July 2007 BT referred disputes with each of the operators listed at Annex 1 to Ofcom for dispute resolution. On 31 August 2007, Ofcom decided it was appropriate for it to handle the disputes referred by BT together;

(G) having considered the submissions of all the parties to the disputes referred by BT, Ofcom set the scope of the issues in dispute to be resolved as follows—

*'The scope of the dispute is to assess the level of charges payable by BT for call termination on 0870 numbers in respect of each of the TCPs included in the dispute. Specifically, Ofcom will consider whether:*

*With effect from the date that the changes to the regulatory regime applicable to calls to 0870 numbers as set out in the NTS Statement come into effect, the termination charges proposed by BT or, where appropriate, the TCPs are reasonable terms and conditions for the purposes of the end-to-end connectivity obligation.*

*In considering whether the proposed charges constitute reasonable terms and conditions, Ofcom will consider the responsibility of operators for additional interconnection charges, including transit (TWIX) and circuit charges.'*

(H) On 14 November 2007, Ofcom indicated that there would be a delay in implementing the changes to the regulation of calls to 0870 numbers set out in the NTS Statement and that these would no longer take effect on 1 February 2008;

(I) in order to resolve this dispute, Ofcom has considered (among other things) the information provided by the parties and Ofcom has further acted in accordance with its general duties set out in section 3 of, and the six Community requirements set out in section 4 of the 2003 Act;

(J) a fuller explanation of the background to the dispute and Ofcom's reasons for making this Determination is set out in the explanatory statement accompanying this Determination; and

**NOW, therefore, Ofcom makes, for the reasons set out in the accompanying explanatory statement, this Determination for resolving this dispute—**

***I Declaration of rights and obligations, etc.***

- 1** That the charge payable by BT to each of the operators listed at Appendix 1 for the termination of calls to 0870 numbers shall be the rates set out in Appendix 2 until such time as alternative charges are in place.

***II Binding nature and effective date***

- 2 This Determination is binding on BT and the operators listed at Appendix 1 in accordance with section 190(8) of the 2003 Act.
- 3 This Determination shall take effect on the date on which the changes to the regulatory regime applicable to the 0870 number range as set out in the NTS Statement come into effect.

### ***III Interpretation***

- 4 For the purpose of interpreting this Determination—
  - a) headings and titles shall be disregarded; and
  - b) the Interpretation Act 1978 shall apply as if this Determination were an Act of Parliament.
- 5 In this Determination—
  - a) **‘2003 Act’** means the Communications Act 2003 (c.21);
  - b) **‘BT’** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 736 of the Companies Act 1985, as amended by the Companies Act 1989;
  - c) **‘Daytime Traffic’** means call traffic originating on or transiting BT’s network during the period of time between 0800 and 1800 on Monday to Friday;
  - d) **‘Evening Traffic’** means call traffic originating on or transiting BT’s network which is not either Daytime Traffic or Weekend Traffic;
  - e) **‘Weekend Traffic’** means call traffic originating on or transiting BT’s network during the period of time between 2400 on Friday and 2400 on Sunday; and
  - f) **‘Ofcom’** means the Office of Communications;

**Neil Buckley**

**Director of Investigations**

**A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2003**

**[ ] 2007**

## Appendix 1

Operator Name (Registered)	Registered number	Registered address
Affiniti Integrated Solution Limited	03317871	Telephone House 37 Carr Lane Hull HU1 3RE
Cable & Wireless U.K.	01541957	Lakeside House Cain Road Bracknell Berkshire RG12 1XL
Cheers International Telecom Limited	03627333	Britannia House 1-11 Glenthorne Road London W6 0LH
Colloquium Limited	SC142248	101 Abercorn Street Paisley Renfrewshire PA3 4AT
COLT Telecommunications	02452736	Beaufort House 15 St Botolph Street London EC3A 7QN
Energis Communications Limited	02630471	Lakeside House Cain Road Bracknell Berkshire RG12 1XL
Easynet Group	03137522	44-46 Whitfield Street London W1P 5RF
Opal Telecom Limited	03849133	Stanford House, Garrett Field Birchwood Warrington WA3 7BH
Opera Telecom Ltd	03383285	3 Brindley Place Birmingham West Midlands B1 2JB
Redstone Communications Limited	030212292	80 Great Eastern Street London EC2A 3RS
Syntec UK Limited	03529985	18 The Avenue West Ealing W13 8PH London

Operator Name (Registered)	Registered number	Registered address
Telxl Limited	04249562	Highfield House 1562 Stratford Rd Hall Green Birmingham West Midlands B28 9HA
Thus plc	SC192666	1 - 2 Berkeley Square 99 Berkeley Street Glasgow G4 7HR
Tiscali UK Limited	03408171	20 Broadwick Street London W1F 8HT
1RT Group Limited	05150214	9 Perseverance Works Kingsland Road London E2 8DD
Aggregated Telecom Limited	03882936	Buxton Court 3 West Way Botley Oxford
Band-X Limited	03342626	6th Floor, Crown House 51 Aldwych London WC2B 4AX
Flexitel Limited	02772380	24-32 London Road Newbury Berkshire RG14 1JX.
Gamma Telecom Holdings Limited	04340834	8-10 New Fetter Lane London EC4A 1RS
GMK Telecom Ltd	04022447	62 Plumstead Common Road Plumstead London SE18 3RD United Kingdom
Inclarity plc	02673204	7th Floor Olympic Office Centre 8 Fulton Road Wembley Middlesex HA9 0NU
Interweb Design Limited	03101247	Global House 2 Crofton Close Lincoln LN3 4NT
IV Response Limited	04318927	57-61 Mortimer Street London W1W 8HS
PNC Telecom Services Limited	03998766	Cavallino House Corsley Heath Warminster BA12 7PL
Prodigy Internet Limited	03828160	217 Portobello Sheffield S1 4DP

<b>Operator Name (Registered)</b>	<b>Registered number</b>	<b>Registered address</b>
Sala Trading Ltd	03617973	121 Edgware Road London W2 2HX
Magrathea Telecommunications Limited	04260485	Albany House 14 Shute End Wokingham Berkshire RG40 1BJ
Skytel Limited	04227994	78 Chorley New Road Bolton BL1 4BY
Vectone Network Limited	05445235	58 Marsh Wall London E14 9TP



## Appendix 2

### Rates payable by BT for termination of calls to 0870 numbers (ppm)

*Point of handover (described in terms of the origination service on BT's network prior to handover)*

*DLE*

*Single Tandem*

Day	Evening	Weekend
0.95	0.58	0.51
0.89	0.56	0.49

## Section 2

# Summary

- 2.1 This dispute concerns the payments made by BT to other communications providers ('CPs') for terminating calls to 0870 numbers. These payments are known as termination charges.
- 2.2 On 4 May 2007, BT issued an Operator Charge Change Notice ('OCCN') giving notice of changes to the termination charges paid by BT to terminating communications providers ('TCPs') for calls to 0870 numbers, with effect from 1 February 2008. BT submits that the notified changes to termination charges were driven by the changes to the regulatory regime applicable to calls to 0870 numbers set out by Ofcom in its statement of 19 April 2006, *NTS: A way forward*<sup>2</sup> ('the NTS Statement') which were due to come into effect on 1 February 2008.
- 2.3 The TCPs listed in Annex 1 to the Determination (collectively, the 'TCPs in dispute') either failed to sign or rejected the OCCN. BT referred the resulting dispute to Ofcom for resolution on 7 July 2007, asking Ofcom to determine that the charges proposed by BT in its OCCN of 4 May 2007 should be applicable.
- 2.4 Ofcom opened an enquiry into this matter on 9 July 2007. On 31 August 2007 Ofcom opened its investigation and published the scope on its on-line Competition Bulletin. In doing so, Ofcom referred to the condition which was imposed on BT on 13 September 2006<sup>3</sup> in relation to end-to-end connectivity ('the End-to-End Obligation'), and which requires that BT purchase wholesale narrowband call termination services on reasonable terms and conditions (including charges). Ofcom also indicated that it was only considering the charges which should be in place between the parties as from the date on which the changes to the regime for calls to 0870 numbers came into effect, as envisaged by BT in issuing the OCCN. The scope of Ofcom's investigation was published as follows:

*'The scope of the dispute is to assess the level of charges payable by BT for call termination on 0870 numbers in respect of each of the TCPs included in the dispute. Specifically, Ofcom will consider whether:*

*With effect from the date that the changes to the regulatory regime applicable to calls to 0870 numbers as set out in the NTS Statement come into effect, the termination charges proposed by BT or, where appropriate, the TCPs are reasonable terms and conditions for the purposes of the end-to-end connectivity obligation.*

*In considering whether the proposed charges constitute reasonable terms and conditions, Ofcom will consider the responsibility of operators for additional interconnection charges, including transit (TWIX) and circuit charges.'*

- 2.5 Certain TCPs (THUS plc ('THUS'), Band-X Limited ('Band-X'), Cable&Wireless U.K. ('Cable&Wireless'), Flextel Limited ('Flextel'), and IVResponse Limited ('IVResponse')) had proposed alternative charges to BT for termination of calls to

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<sup>2</sup> [http://www.ofcom.org.uk/consult/condocs/nts\\_forward/statement/statement.pdf](http://www.ofcom.org.uk/consult/condocs/nts_forward/statement/statement.pdf)

<sup>3</sup> End-to-end connectivity – Statement, at

[http://www.ofcom.org.uk/consult/condocs/end\\_to\\_end/statement/statement.pdf](http://www.ofcom.org.uk/consult/condocs/end_to_end/statement/statement.pdf)

0870 numbers. These proposed charges were rejected by BT. On 16 October 2007 and 30 October 2007, Ofcom updated its Competition Bulletin to reflect the fact that these proposals had been included within the scope of this dispute.

- 2.6 In resolving this dispute, Ofcom has considered that the effective date for the determination of the disputes should be the date on which the changes to the regulatory regime applicable to calls to 0870 numbers (as set out in the NTS Statement) comes into effect. Ofcom considers that, prior to this point, BT is subject to a different regulatory regime in respect of payments to TCPs for calls to 0870 numbers which is not in dispute. It is therefore appropriate in this case to limit Ofcom's determination to the period following those changes.
- 2.7 As regards the level of the charges in dispute, Ofcom has examined whether the disputed call termination charges constitute reasonable charges for the purposes of the End-to-End Obligation. In order to assess the reasonableness of the proposed charges, Ofcom has first considered BT's gains from trade at the disputed charges (i.e. whether BT would make a profit from connectivity with the TCPs in relation to the termination of calls to 0870 numbers). In conducting this assessment, Ofcom is of the view that it would not be reasonable to require BT to increase its retail price for calls to geographic numbers in order to obtain a profit on calls to 0870. Ofcom is also of the view that it would be unreasonable to require BT to charge a higher retail rate for calls to 0870 numbers than that for geographic calls through the use of a free to caller pre-announcement. Ofcom considers that, if it were to determine otherwise, its determinations would have the effect of undermining the policy objectives set out in the NTS Statement.
- 2.8 In assessing BT's gains from trade, Ofcom has also considered whether the disputed charges might facilitate undesirable arbitrage<sup>4</sup> which would have an effect on BT's gains from trade. Indeed, Ofcom set out in the NTS statement that its objective in removing calls to 0870 numbers from the scope of SMP Condition AA11 ("the NTS Condition") was to reduce the regulatory support for revenue share which could give rise to undesirable arbitrage opportunities. Ofcom considered that the risk of arbitrage could lead to undesirable outcomes for consumers which might undermine the purpose of its proposals and be detrimental to consumers<sup>5</sup>.
- 2.9 Finally, Ofcom has considered whether the charges which may be considered reasonable from the perspective of a TCP in that they would also allow TCPs to obtain gains from trade.
- 2.10 In summary, based on the evidence gathered in these disputes and for the reasons set out in this draft determination and explanatory statement, Ofcom's provisional conclusion is that the charges as set out in the table below are reasonable rates for the purposes of the End-to-End Obligation, as both BT and the TCPs are able to make gains from trade at that level and the risk of undesirable arbitrage is minimised. Ofcom therefore considers that BT should be required to purchase termination of calls to 0870 numbers at these rates.

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<sup>4</sup> i.e. the artificial creation of 0870 traffic to profit from revenue sharing.

<sup>5</sup> paragraph 4.128 NTS Statement

**Table 1 Proposed maximum Day ('D'), Evening ('E') and Weekend ('W') 0870 NTS termination rates for various points of handover**

*Point of handover (described in terms of the origination service on BT's network prior to handover)*

*DLE*

*Single tandem*

D	E	W
0.95	0.58	0.51
0.89	0.56	0.49

- 2.11 Ofcom notes that at the time of writing this draft determination, the changes to the regulatory regime applicable to calls to 0870 numbers set out by Ofcom in the NTS Statement are not currently in effect. Ofcom set out in the scope of the present disputes that it would be considering the reasonableness of the rates only with effect from the date on which the changes to the regulatory regime applicable to calls to 0870 numbers as set out in the NTS Statement come into effect. The charges proposed by Ofcom in this determination are therefore not effective before the date that those changes are implemented.
- 2.12 Ofcom recognises that the proposed effective date of BT's OCCN of 4 May 2007 was stated to be 1 February 2008 on the basis that this was the likely date that the changes to the regulatory regime applicable to calls to 0870 numbers would come into effect. Ofcom notified CPs of a delay to the implementation of those changes on 14 November 2007<sup>6</sup> with the result that the changes would not have effect by 1 February 2008. In light of this delay, BT will remain subject to the NTS Condition until such date as Ofcom determines following 1 February 2008.
- 2.13 The background to this investigation is set out in **section 3**. The history to these disputes is set out in **section 4** and the submissions of the parties are set out in **section 5**. Ofcom's analysis and reasoning for this decision is set out in **section 6**.

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<sup>6</sup> <http://www.ofcom.org.uk/consult/condocs/numbering03/letternts.pdf>

## Section 3

# Background

## 0870 Number range and NTS

- 3.1 Number Translation Service ('NTS') numbers are examples of non-geographic numbers in that the number dialled does not relate to a specific geographic location, but instead relates to a particular service.
- 3.2 NTS numbers are used by organisations and individuals to provide access to a very wide range of services from pay-as-you-go dial-up internet access to financial services, road traffic advice and tele-voting on TV programmes.
- 3.3 0870 numbers form part of a range of NTS numbers. 0870 numbers are principally used to provide access to pre- and post-sales enquiry lines, some public sector services and services such as the international telephony services provided by resellers.
- 3.4 When the 0870 range was introduced, calls were charged at BT's national rate for geographic calls. Consequently, 0870 numbers were known as 'national rate' numbers. BT remains subject to a requirement to continue to price such calls to its customers at its standard national rate by the designation contained in The National Telephone Numbering Plan ('the Plan')<sup>7</sup>. Other CPs are not subject to the same requirement.
- 3.5 In recent years, the linkage between 0870 charges and national geographic call charges has broken down because (i) CPs other than BT have charged retail prices for calls to 0870 numbers in excess of national geographic call charges and (ii) geographic calls have been included in call packages (by BT and other CPs) whereas calls to 0870 numbers have not. This has resulted in most consumers paying more for 0870 calls than for national calls to geographic numbers.

## The NTS Statement

- 3.6 On 28 September 2005, Ofcom published a consultation entitled *Number Translation Services: A Way Forward*<sup>8</sup> ('the September 2005 Consultation') in which it proposed changes to the regulatory regime for NTS to address growing concerns amongst industry and consumer stakeholders about the operation of the regulatory regime. On 19 April 2006 Ofcom published the NTS Statement, in which Ofcom confirmed that it would implement certain of the proposals that were set out in the September 2005 Consultation.
- 3.7 The changes to the NTS regime as confirmed in the NTS Statement that are of particular relevance to this dispute are as follows:
  - **Restoring the geographic link for 0870 calls:** Ofcom confirmed that it would amend the Plan to establish the principle that every Originating Communications Provider ('OCP') should charge no more for 0870 calls than national calls to geographic numbers. OCPs who wish to charge higher rates for 0870 calls would be required to make a free-to-caller price pre-announcement at the beginning of

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<sup>7</sup> the latest version is available at <http://www.ofcom.org.uk/telecoms/loi/numbers/numplan081107.pdf>

<sup>8</sup> [http://www.ofcom.org.uk/consult/condocs/nts\\_forward/nts\\_way\\_forward.pdf](http://www.ofcom.org.uk/consult/condocs/nts_forward/nts_way_forward.pdf)

the call, informing the caller of the cost of the call. Ofcom anticipated that the restoration of the link should lead to the inclusion of calls to 0870 numbers in call packages; and

- **Remove 0870 calls from the scope of the BT NTS Call Origination Condition:** Ofcom confirmed that it would remove 0870 calls from the scope of SMP Condition AA11 ('the NTS Condition'), which requires BT to originate and retail these calls on behalf of TCPs.<sup>9</sup> This would remove the regulatory underpinning for revenue sharing on the 0870 range, and allow interconnect arrangements for these calls to be aligned more closely with those for geographic calls, with BT purchasing call termination from TCPs rather than originating and retailing 0870 calls on behalf of TCPs. In the NTS Statement Ofcom noted that this was likely to lead to a reduction in the payments that OCPs make to TCPs for terminating 0870 calls, and to lower prices for 0870 calls at the retail level.

3.8 This latter proposal took account of the risk that arbitrage opportunities might occur if 0870 calls remained within the scope of the NTS Condition. Paragraphs 4.126-4.129 of the NTS Statement (repeated here for ease of reference) outlined Ofcom's views in this regards as follows:

*4.126 In reaching this conclusion, Ofcom has also taken account of the possibility that maintaining 0870 calls within the scope of the NTS Condition would give rise to arbitrage opportunities, once the link to geographic charges has been restored. If 0870 calls remained within the scope of the NTS Condition, there would continue to be some scope for revenue sharing on 0870 calls, albeit at a much lower level than at present. But once the geographic link has been restored, 0870 calls are likely to be included in flat rate call packages now offered by most major OCPs, including for example BT's BT Together Options 2 and 3. This means that there would be an opportunity to make additional 0870 calls, at no cost to the caller, solely in order to generate a revenue share.*

*4.127 Faced with this sort of arbitrage, OCPs would be likely to explore several options:*

- *taking measures to prevent the calls being made e.g. by blocking access to affected numbers;*
- *taking measures to prevent a revenue share being made on calls of this kind; or*
- *raising the prices of their call packages.*

*4.128 Ofcom's observations on these options are as follows:*

- *In order to apply the first two of the options, OCPs would first need to be able to distinguish between normal 0870 calls and arbitrage calls. Ofcom's discussions with OCPs indicate that this would be a difficult task;*

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<sup>9</sup> The NTS Condition (SMP Condition AA11) controls the setting of termination charges for calls to 0870 numbers. SMP Condition AA11 specifies that the only charges that may be made for providing NTS call origination services are a charge for the Call Origination Service used to originate the NTS Call, a charge for the NTS Retail Uplift and a charge for bad debt relating to the retailing by BT of Premium Rate Services calls.

- If the solution involved prevention of the revenue share on 0870 calls included in flat rate packages, this would undermine the purpose of the NTS Condition; and
- If the result was an increase in the price of packages that would clearly be detrimental to the interests of consumers.

4.129 These factors reinforce Ofcom's view that the appropriate course of action is to remove 0870 calls from the scope of the NTS Condition'.

- 3.9 Ofcom's concern in removing 0870 calls from the scope of the NTS Condition was to ensure that outpayments made by TCPs through revenue sharing would not enable arbitrage to occur so as undermine Ofcom's aim of restoring the geographic link by placing the sustainability of retail call packages at risk.
- 3.10 There are various ways in which this arbitrage opportunity might occur. For example:
- ✂
  - ✂
- 3.11 ✂
- 3.12 ✂

## Figure 1

✂

- 3.13 ✂
- 3.14 Ofcom notes that at the time of writing this draft determination, the changes to the regulatory regime applicable to calls to 0870 numbers set out by Ofcom in the NTS Statement are not currently in effect and BT is still subject to the NTS condition when purchasing call termination for calls to 0870 numbers. The charges proposed by Ofcom in this determination are therefore not to be effective before the date that those changes come into effect.
- 3.15 Until such time as the changes to the regulatory regime applicable to calls to 0870 numbers come into effect, BT will remain subject to the NTS Condition. Ofcom is therefore of the view that, despite the fact that BT's OCCN of 4 July 2007 is stated to be effective as from 1 February 2008, BT will remain subject to the NTS Condition for a short period after that date. Ofcom would expect that payments by BT to TCPs for calls to 0870 numbers during the period 1 February 2008 until the entry into force of Ofcom's changes to the regulatory regime for calls to 0870 numbers should remain compliant with the NTS Condition.

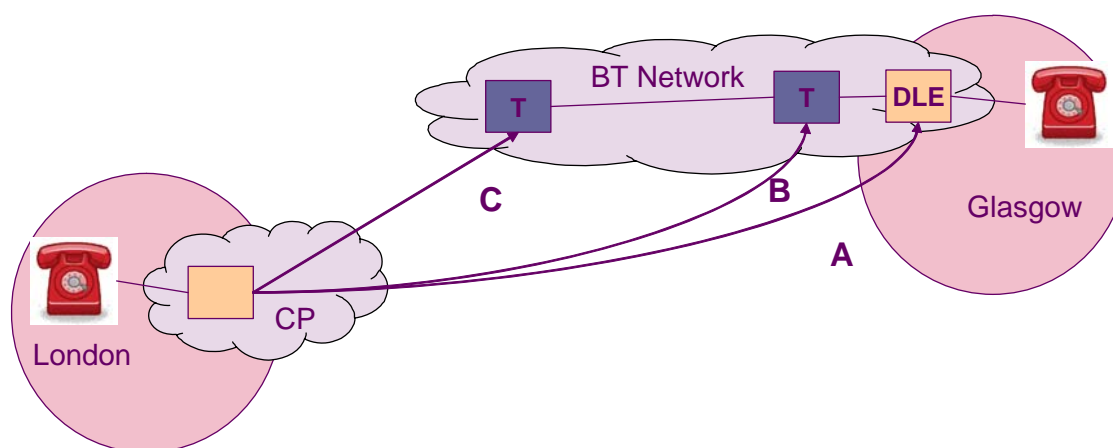
## The conveyance and routing of NTS Calls

- 3.16 For a given NTS call, there can be several different CPs involved in conveying the call from the caller to the organisation or individual receiving the call. This includes an OCP, on whose network the call commences, and a TCP, on whose network the NTS number resides. The OCP and the TCP may be the same for some calls. There may also be a CP carrying the call between the OCP and the TCP. This is known as

a 'transit' service and payments for this transit service are known as 'TWIX' payments.

- 3.17 At a technical level, the NTS number dialled by a caller is 'translated' by the network to a geographic number to deliver the call to its destination. A commonly used industry term for the translation of an NTS number into a geographic number to facilitate call termination on the destination number is 'IN DIP'. It is called this because translations were originally performed by an overlay network known as an Intelligent Network (or IN). DIP means the transaction in which the PSTN network requests the IN to provide a number translation.
- 3.18 The conveyance of an NTS call can be contrasted with that of a geographic call. For a geographic call, the geographic destination of the call is known to the originating network, which is not the case for a call to a 0870 number. As a result, calls to geographic numbers have typically been routed according to the principle of fare end handover, whereby the OCP will seek to carry the call as far as possible on its own network.
- 3.19 Figure 2 illustrates the far end handover principle for geographic calls originated in London and terminated to a geographic number in Glasgow.

**Figure 2 Far-end Handover for Geographic Call**



**Termination Charge**

A – DLE Termination

B - Single Tandem

C - Double Tandem termination (short, medium or long depending on distance from final tandem exchange)

- 3.20 When an OCP passes a **geographic call** to a CP for termination, the TCP levies a call termination charge. TCPs normally have a ladder of interconnection charges to reflect the distance and the number of switching stages over which they carry calls before they are terminated.<sup>10</sup> OCPs normally carry calls on their own networks and

<sup>10</sup> Strictly speaking, when BT acts as a TCP it offers a ladder of interconnection charges, and under the reciprocity arrangements, other TCPs also offer the same ladder of charges at the same rates as offered by BT. The reciprocity arrangements stem from the fact that charges for fixed geographic call termination have since 1997 been calculated on the basis of a principle of reciprocal charging (See the Ofcom statement *Network Charges from 1997*, published July 1997. See also: *Determination to resolve a dispute between BT and Telewest about geographic call termination reciprocity agreement – Final Statement*, 16 June 2006). Available at:

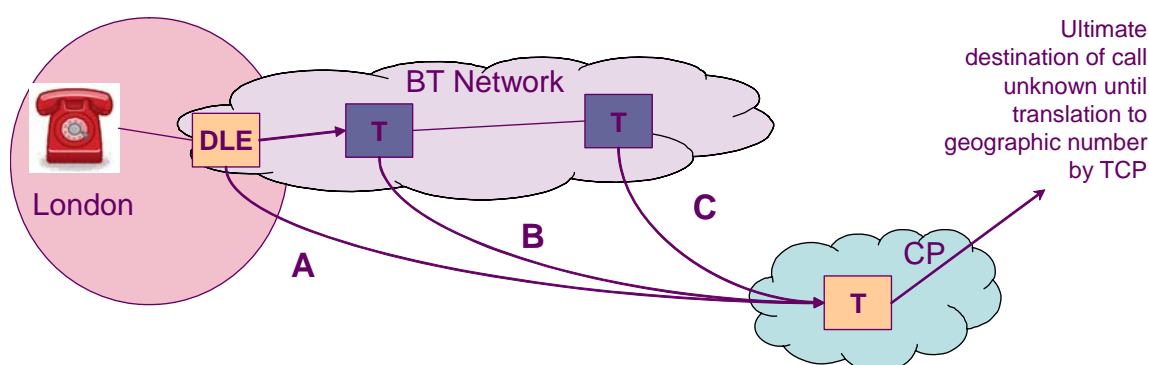


deliver them to the TCP as close to their ultimate (geographic) destination as possible, in order to maximise the use of their own networks and to minimise the termination charges payable to TCPs. This routing principle is conventionally referred to as 'far-end handover' and is applicable to the second leg of 0870 calls (i.e. following translation when the call is destined for a geographic number):

- Digital Local exchange ('DLE') Termination: where an OCP who has a large network carries the call all the way across to Glasgow on its own network, resulting in the lowest termination charge for the TCP for a geographic call.
- Single Tandem ('ST') Termination: where an OCP who has a smaller network can carry the call sufficiently close to one tandem switch from its destination and can then hand the call over to BT for transit to Glasgow, resulting in a higher termination charge for the TCP for a geographic call.
- Double Tandem ('DT') Termination: where the OCP quickly hands the call over to BT for transit to Glasgow, resulting in the highest termination charge for the TCP for a geographic call.

3.21 In contrast to calls to geographic numbers, calls to 0870 numbers (and other NTS number ranges) are currently typically routed according to the principle known as near end handover. As 0870 numbers and other NTS numbers are non-geographic (i.e. do not relate to a specific geographic destination) the far-end handover approach cannot be applied to the first leg of the call (before translation to a geographic number). CPs therefore structure interconnection charges and route calls on a near-end handover basis, taking the call off the OCP's network as soon as possible and routing onto the TCP's own network to minimise the origination and transit payments to the OCP. See Figure 3 for an illustration of the near-end handover of a call originated in London and destined to a geographic number following translation by the TCP.

**Figure 3 Near-end Handover for NTS Call**



**Termination Charge**

A – DLE Termination

B - Single Tandem

C - Double Tandem termination (short, medium or long depending on distance from first tandem exchange)

3.22 With near-end handover, TCPs currently have an incentive to use their own networks to the largest extent possible because the incremental costs of their own networks

are likely to be cheaper than paying origination and transit charges to BT at standard charges. This principle is also consistent with OCPs' commercial objectives since termination payments vary according to the use of their networks. It is convenient to describe these termination services in terms of the corresponding origination services on the OCP's (i.e. BT's) network prior to the point of hand-over to the TCP. So, the points of handover would be:

- Corresponding to DLE origination by OCP: where a TCP who has a large network picks up the call early from the DLE and carries the call to the point of translation, resulting in the highest termination charge paid to the TCP for NTS traffic.
- Corresponding to ST origination by OCP: where BT originates the call up to the first tandem switch on its network for hand-over to a smaller TCP, resulting in a lower termination charge paid to the TCP for NTS traffic.
- Corresponding to DT origination by OCP: where BT originates the call for the maximum distance across its network for hand-over to a very small TCP, resulting in the lowest termination charge paid to the TCP for NTS traffic.

3.23 Ofcom recognises that, following the changes to the 0870 regime, the principles of routing applicable to calls to 0870 numbers may also change. Ofcom has therefore considered it appropriate, in resolving the dispute, to consider the responsibility of operators for certain of the interconnection charges that arise when an 0870 call is terminated on a TCP's network, specifically transit (TWIX) and circuit charges. This is set out in more detail in Ofcom's analysis and reasoning section below.

## End-to-end connectivity

- 3.24 End-to-end connectivity describes the objective of enabling retail customers to make calls to other customers or services on the same network or other providers' networks. This is important for both competition generally and end-users individually. Competing communications providers need to be able to interconnect with other networks in order to provide a full service to their customers. Customers expect to be able to call every other retail customer irrespective of the network to which the called party is connected.
- 3.25 In July 2006 Ofcom published a consultation document outlining its proposals to introduce the End-to-End Obligation.<sup>11</sup> In that consultation Ofcom considered that the guidance Oftel had previously issued on the subject of end-to-end connectivity was insufficient, because it relied on BT's universal service obligations which did not extend to a requirement to connect end-users to every network.<sup>12</sup>
- 3.26 In the light of this, Ofcom set out its proposal to impose the End-to-End Obligation on BT, and on 13 September 2006 Ofcom published a statement– *End-to-End connectivity – Statement* ('the End-to-End Statement') in which Ofcom imposed the End-to-End Obligation on BT<sup>13</sup>.

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<sup>11</sup> End-to-End connectivity – Consultation, at [http://www.ofcom.org.uk/consult/condocs/end\\_to\\_end/end2end.pdf](http://www.ofcom.org.uk/consult/condocs/end_to_end/end2end.pdf)

<sup>12</sup> End-to-end connectivity – Guidance issued by the Director General of Telecommunications, at [http://www.ofcom.org.uk/static/archive/oftel/publications/eu\\_directives/2003/endcon0503.htm](http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/2003/endcon0503.htm)

<sup>13</sup> End-to-end connectivity – Statement, at [http://www.ofcom.org.uk/consult/condocs/end\\_to\\_end/statement/statement.pdf](http://www.ofcom.org.uk/consult/condocs/end_to_end/statement/statement.pdf)

## Section 4

# History of the disputes

## The parties to the disputes

### BT

- 4.1 British Telecommunications plc is a wholly-owned subsidiary of BT Group plc and encompasses virtually all the businesses and assets of the BT Group.
- 4.2 BT describes itself as a provider of communications solutions and services operating in 170 countries. BT's principal activities include networked IT services, local, national and international telecommunications services, and higher-value broadband and internet products and services. In the UK, BT states that it serves business and residential customers, as well as providing network services to other operators.<sup>14</sup>

### The TCPs

#### Network and Non-Network TCPs

- 4.3 All of the TCPs listed in Annexes 1 and 2 to this explanatory statement terminate 0870 calls.
- 4.4 TCPs offering 0870 termination/hosting services vary hugely in scale, ranging from small organisations specialising the provision of particular categories of service (such as call centre applications or basic translation services) to large organisations offering a broad range of NTS services as well as many other non-NTS services.
- 4.5 TCPs also vary in the geographic reach of their networks. The largest have networks that span the UK and the smallest operate from a single location, utilising other CPs' networks for call conveyance without possessing any network of their own ('island TCPs'). Those with extensive geographic reach are able to carry traffic greater distances on their networks and are therefore able to minimise their termination payments to other CPs for the geographic termination after the 0870 number translates into a geographic number. As previously discussed, under the current regime applicable to calls to 0870 numbers (and NTS calls more generally) TCPs have an incentive to collect calls from OCPs close to their origin in order to maximise the termination payments they receive from OCPs.

## History of the dispute

- 4.6 In referring the dispute, BT submitted that the main forum for discussion of implementation of the changes to 0870 proposed by Ofcom in the NTS Statement was the NTS Focus Group ('NTS FG').
- 4.7 BT submitted that it had initiated discussion at the NTS FG in January 2006, prior to the publication of the NTS Statement, aware that it could take a considerable period to reach consensus. It would appear that the NTS FG meetings on the following dates are of particular relevance to this dispute:

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<sup>14</sup> Source: Annual Report 2007 at <http://www.btplc.com/Sharesandperformance/Annualreportandreview/Annualreports/AnnualReports.htm>

- At the 11 May 2006 NTS FG, BT indicated that its proposal for 0870 termination rates would be based on the geographic call model;
- On 3 July 2006, TCPs discussed how to approach 0870 termination and were unable to reach a consensus but identified a number of issues to resolve;
- At the 6 July 2006 NTS FG meeting, BT presented issues for consideration which it had identified. These included routing principles, ownership of circuits, TWIX payments and contractual considerations. BT stated that these issues broadly matched those identified by TCPs on 3 July 2006; and
- At the 2 November 2006 meeting THUS proposed a set of 0870 termination charges.

4.8 On 4 May 2007, BT issued an OCCN to TCPs which included a calculation of termination rates for 0870 calls based on geographic termination rates. These charges are set out in Figure 4:

**Figure 4 BT's proposed termination charges**

(i) New termination payments for 0870 calls - BT originated traffic

Service	Effective Date	Daytime (ppm)	Evening (ppm)	Weekend (ppm)
ST Termination	1 February 2008	-0.2657	-0.1249	-0.1003
DLE Termination	1 February 2008	-0.3763	-0.1756	-0.1402

(ii) New termination payments for 0870 calls - Transit traffic (excluding bespoke agreements made by other network operators and TCPs)

Service	Effective Date	Daytime (ppm)	Evening (ppm)	Weekend (ppm)
ST Termination	1 February 2008	-0.2657	-0.1249	-0.1003

Notes:

- (i) A negative number indicates a payment from BT to the TCP.
- (ii) The ST Termination rates are calculated based on the average actual charges paid by BT to other network operators for geographic call termination for March 2007 (excluding DLE handover).

4.9 A number of TCPs rejected the terms of the BT OCCN. On 7 July 2007 BT referred these TCPs as part of this dispute to Ofcom for resolution.

4.10 There were a number of additional TCPs who had failed to respond to the BT OCCN or were in continued dialogue with BT. BT and the additional TCPs listed in Annex 2 could not reach agreement and on 6 August 2007 BT referred these TCPs for inclusion within this dispute.

4.11 On 31 August 2007 Ofcom opened its investigation and published the scope on its on-line Competition Bulletin as follows:

*'The scope of the dispute is to assess the level of charges payable by BT for call termination on 0870 numbers in respect of each of the TCPs included in the dispute. Specifically, Ofcom will consider whether:*

*With effect from the date that the changes to the regulatory regime applicable to calls to 0870 numbers as set out in the NTS Statement come into effect, the termination charges proposed by BT or, where appropriate, the TCPs are reasonable terms and conditions for the purposes of the end-to-end connectivity obligation.*

*In considering whether the proposed charges constitute reasonable terms and conditions, Ofcom will consider the responsibility of operators for additional interconnection charges, including transit (TWIX) and circuit charges.'*

- 4.12 Certain TCPs proposed alternative charges for termination of calls to 0870 numbers during their negotiations with BT. THUS, Band-X, Cable&Wireless and Flextel all provided evidence to Ofcom of having proposed their own rates to BT for terminating calls to 0870 numbers, which were rejected by BT. On 16 October, Ofcom updated its Competition Bulletin to reflect the fact that these proposals had been included within the scope of this dispute. IVResponse also provided evidence to Ofcom of having proposed their own rates to BT for terminating calls to 0870 numbers, which were rejected by BT. On 30 October 2007, Ofcom updated its Competition Bulletin to include IVResponse's proposal within the scope of this dispute.
- 4.13 BT's proposed charges and the alternative charges proposed by TCPs to BT are set out in Figure 5 below.

**Figure 5**

CP	Interconnection point	proposed termination charges		
		ppm		
		Day	Evening	Weekend
<b>BT (OCP)</b>	ST Termination	0.2657	0.1249	0.1003
	DLE Termination	0.3763	0.1756	0.1402
	ST Termination (Transit)	0.2657	0.1249	0.1003
<b>THUS</b>	Local Exchange	0.49617	0.22709	0.17885
	Single Tandem	0.38907	0.17809	0.14025
	Double Short	0.13917	0.06359	0.05015
	Double Medium	-0.03463	-0.01591	-0.01255
	Double Long	-0.27433	-0.12571	-0.09895
<b>Band-X</b>	ST	✂	✂	✂
	DLE	✂	✂	✂
<b>C&amp;W</b>	Base rate (DTS)	✂	✂	✂
	At DLE (Base + LTC)	✂	✂	✂
	Incoming transit (Base)	✂	✂	✂
	Direct from OLO (Base + half transit)	✂	✂	✂
<b>Flextel</b>	ST	4	4	4
<b>IVResponse</b>	ST	1.5	1.5	1.5

Note: THUS' proposed termination rates include conveyance costs paid to BT. Negative termination rates indicate that THUS would pay out more to BT for conveyance services than it would receive from BT for termination services.

### **Information sought by Ofcom**

- 4.14 On 19 September 2007 Ofcom wrote to BT requesting its views on who should bear the responsibility for interconnections charges, including transit (TWIX), and on which are the relevant points of interconnection for calls originated or transited by BT and destined for termination on another operator's network.
- 4.15 On 1 October 2007, Ofcom sent an information request under Section 191 of the 2003 Act (this request was sent in draft on 19 September 2007) to BT requesting information, amongst other things, on its costs and revenues of originating and transiting calls for 0870 numbers.
- 4.16 On 27 October 2007 Ofcom wrote to the TCPs requesting views on who should bear the responsibility for interconnections charges, including transit (TWIX) and about the points of interconnection for calls originated or transited by BT and destined for termination on the TCP's network.
- 4.17 During the investigation, Ofcom met with BT, Cable&Wireless and Band-X.

## Section 5

# The submissions of the parties

- 5.1 In addition to the information from BT, Ofcom also received submissions from Easynet Group ('Easynet'), Flextel, Cable&Wireless, COLT Telecommunications, Cheers International Telecom Limited ('Cheers International'), Band-X, PNC Telecom Services Limited ('PNC Telecom Services'), THUS, Syntec UK Limited ('Syntec'), Magrathea Telecommunications Limited ('Magrathea Telecommunications'), and Carphone Warehouse Group ('Carphone Warehouse').
- 5.2 The submissions of the parties can be broken down into the following issues:
- Responsibility for payment of circuit charges;
  - Responsibility for payment of transit charges (TWIX);
  - Routing of calls and points of interconnection;
  - Responsibility for payment of IN DIP costs;
  - Free-to-caller pre-call announcement of the price for the call; and
  - Under recovery of call termination costs by 0870 TCPs.

## Circuit charges

- 5.3 The circuits in question are the interconnection circuits connecting BT's network to the TCP's network.
- 5.4 BT submitted that TCPs currently have responsibility for circuit charges for 0870 calls as they own the traffic stream under the Standard Interconnect Agreement ('SIA'). The reverse is currently the case for geographic termination rates, where the OCP pays for the circuit as they own this traffic stream under the SIA. BT proposed that as 0870 will continue to be classified as a NTS number range, responsibility for circuit charges should remain with the TCP. This follows the existing model for 0800 services, which equally do not support revenue share, and for which circuit charges are also born by the 0800 terminator and supported from revenues received from Service Providers ('SP') who wish to use these number ranges.
- 5.5 PNC Telecom Services and Band-X submitted that the party making the profit should pay for interconnection circuits. The changes to 0870 allow BT to make a profit, therefore BT should pay for interconnect circuits. THUS, Syntec and Easynet submitted that BT, as the OCP, should be responsible for providing the interconnect circuits to carry the traffic, as is the case with geographic call termination.
- 5.6 COLT and Carphone Warehouse submitted that the TCP should pay for interconnect circuits. Magrathea Telecommunications submitted that if the interconnection for 0870 numbers is maintained according to NTS calls, then the TCP should pay for the circuits. BT and Cable&Wireless submitted that a change in traffic ownership is not a pragmatic solution as 0870 traffic is carried on shared routes with other traffic that remains the responsibility of the TCP.



## Responsibility for Transit Charges (TWIX)

- 5.7 The TCP is currently responsible for the transit payment for 0870 calls terminated on its network. In referring this dispute BT submitted that, although the route taken by the call is the decision of the OCP, the call is still an NTS call and may need an IN DIP. Both current capacity and existing routing plans are in place to route calls efficiently to the TCP's nominated switches where these IN platforms sit. Changing the commercial position on who pays the transit is likely to involve a large amount of circuit and routing re-arrangements for both BT and TCPs, whereby the OCP would try to reduce the transit charge by routing calls differently.
- 5.8 BT submitted that there is therefore limited benefit in changing the existing transit arrangements, and consequently 0870 number range holders i.e. the TCPs should pay for the transit service over the BT network. BT further submitted that the TCP should pay for transit as it is the TCP that translates the 0870 number and knows where its customer is located.
- 5.9 Cable&Wireless submitted that if TCPs were liable for transit payments, in addition to providing the capacity to carry the traffic, there would be no incentive for OCPs to route directly to the TCP. Cable&Wireless submitted that it 'asserts the right to recover costs in the collection / conveyance of 0870 calls'
- 5.10 Easynet, PNC Telecom, COLT Telecommunications, Band-X, THUS and Cable&Wireless submitted that the OCP, BT, should pay for transit charges as the OCP is making a profit.
- 5.11 Carphone Warehouse submitted that the TCP should pay for the transit charges as the TCP is the owner of the service and should therefore be responsible for its costs.

## Routing of calls and points of interconnection

- 5.12 The TCP is currently responsible for the transit payment for 0870 calls terminated on its network. BT submitted that it believes that the near-end versus far-end position is linked to the debate between call terminators and originators as to who pays for the transit and circuit charges. If responsibility for the transit payment was to change from TCP to OCP this is likely to require a change in the routing principle for 0870 calls.<sup>15</sup>
- 5.13 BT submitted that this would require very large levels of circuit re-arrangements, both at the interconnect level and within BT and CP's internal networks, at a time when many networks are evolving to new technologies.
- 5.14 Cable&Wireless hold the view that near-end handover of non-geographic traffic remains the most efficient form of routing and the most pragmatic as only the TCP is able determine the destination of a call to 0870. Carphone Warehouse submitted that the appropriate points of interconnection should be determined so as to encourage the deepest point of interconnection with BT's network.
- 5.15 Band-X, PNC Telecom, Cable&Wireless and Carphone Warehouse submitted that the TCP should determine the point of interconnection.

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<sup>15</sup> Change from NTS routing principle of near-end handover to a fixed geographic routing principle of far-end handover arrangements.



- 5.16 Cable&Wireless agree with BT that keeping the routing of calls unchanged is the most pragmatic option. However, Cable&Wireless submitted that the difference in costs associated with delivery of a geographic number compared with those of a 0870 call should be taken into account when setting the termination rates for 0870 calls.

### **Intelligent Network Access (IN DIP)**

- 5.17 Currently, the IN DIP is carried out on the TCP's network, for which the costs are borne by the TCP. BT submitted that a number of TCPs have indicated that they consider these charges to be the responsibility of the OCP. Calls to 0870 number ranges will continue to require number translation via the IN platform after the changes to the regulations for 0870 number range. It is BT's view that as this is an activity which is required by the 0870 number range owner, to enable the call to be terminated on their network, then the charge for this activity should be the responsibility of the TCP only.

### **Free-to-caller pre-call announcement of the price for the call**

- 5.18 BT submitted that Flextel has requested a retail price for 0870 which would exceed the national geographic call charge limit, which would force BT to implement a free to caller pre-call announcement stating the price for the call.
- 5.19 BT submitted that TCPs are not in a position to specify the charges that BT will apply to consumers for 0870 calls. Calls from BT Retail's customers to 0870 have always been subject to charges developed by BT Retail,<sup>16</sup> including BT Retail call packages and discount schemes. BT added that TCPs have no authority to dictate BT's 0870 retail charges.

### **Under-recovery of call termination costs by 0870 TCPs**

- 5.20 BT submitted that a number of TCPs have expressed concern that the rates proposed by BT in its OCCN would not enable full cost recovery.
- 5.21 BT does not believe that the termination charge is the only source of revenue for TCPs for 0870, and considers that charges made by TCPs to their SP customers could reflect the degree of costs associated with 0870 termination. BT further submitted that NTS, at its conception, was not designed to provide micro-payment opportunities to SPs but to provide the functionality of number translation. This principle continues to be reflected in cost recovery arrangements for 0800 numbers. SPs already pay a fee for the advantages of access by consumers to these numbers. BT further submitted that there is no barrier to this charge being applied by TCPs for access to the number translation advantages of 0870 number ranges and that this is the approach which is being adopted by BT's own 0870 Inbound Services.

### **Variation of termination charges according to point of interconnection**

- 5.22 BT submitted that the termination charge should not vary because of the network elements used in the TCP network; any costs should be borne by the TCP and SP.

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<sup>16</sup> BT Retail has no regulatory constraints on the setting call origination call charges

- 5.23 Carphone Warehouse submitted that termination charges should vary according to the depth of interconnection. Easynet submitted that they are satisfied with termination rates for single tandem interconnection.
- 5.24 THUS submitted that calls which use fewer BT network elements should have a lower termination charge. THUS does not believe that average termination rates are appropriate in this context and that the rates offered by BT must accurately reflect the cost of conveyance across BT's network.
- 5.25 Flextel submitted that termination charges should not vary with points of interconnect. The cost of call conveyance should be the determined termination rate plus transit costs paid by the OCP.

## Section 6

# Ofcom's analysis and reasoning

## Introduction

- 6.1 In setting out its analysis and reasoning in resolving these disputes, Ofcom considers:
- whether the End-to-End Obligation is applicable to these disputes; and
  - to the extent applicable, the reasonableness of the disputed 0870 termination rates for the purposes of the End-to-End Obligation.

## Application of the End-to-End Obligation to these disputes

- 6.2 As set out in section 3, on 13 September 2006 Ofcom imposed the End-to-End Obligation on BT. The End-to-End Obligation requires BT to purchase wholesale narrowband call termination services unless the terms and conditions (including charges) which are proposed are unreasonable. As call termination for 0870 numbers is wholesale narrowband call termination, Ofcom considers that the End-to-End Obligation is relevant to the dispute to the extent that TCPs have made a request to BT to purchase call termination for 0870 numbers.
- 6.3 Ofcom considers that the End-to-End Obligation is relevant to each of the disputes. In the case of the disputes between BT and each of THUS, Band-X, Cable&Wireless, IV Response, and Flextel, the End-to-End obligation is relevant on the basis that there is a clear request for the purchase of wholesale narrowband call termination by the TCP (in proposing the termination rates to BT) which has been rejected by BT. In the case of the disputes between BT and the remaining TCPs listed in Annex 1, and as set out in more detail below, Ofcom considers that the End-to-End Obligation will also be engaged on the basis that the issue of the 4 May 2007 OCCN by BT amounts to a refusal to continue to purchase call termination for 0870 numbers at the existing levels (i.e. prior to the implementation of the changes to the 0870 regime set out in the NTS Statement).
- 6.4 The End-to-End Obligation provides that:
- ‘1.1 Where a provider of a Public Electronic Communications Network reasonably requests in writing the Connectivity Provider [i.e. BT] to purchase wholesale narrowband call termination services (fixed and mobile voice, and Narrowband Data) provided by it, the Connectivity Provider shall purchase such services.
- 1.2 The purchase of such services shall occur as soon as reasonably practicable and shall be on reasonable terms and conditions (including charges) and on such terms and conditions (including charges) as Ofcom may from time to time direct.
- 1.3 In purchasing such services, the Connectivity Provider cannot after such purchase unreasonably change, withdraw or restrict access to an applicable Normal Telephone Number.

*1.4 The Connectivity Provider shall comply with any direction Ofcom may make from time to time under this condition.'*

- 6.5 Call termination for 0870 numbers is a wholesale narrowband call termination service and BT is therefore obliged to purchase those services under Condition 1.1, where it receives a reasonable request to do so.
- 6.6 However, BT's obligation to do so is qualified by Condition 1.2 which provides that the purchase of such services shall be on 'reasonable terms and conditions (including charges)'. If the terms and conditions (including charges) which are proposed by a provider of a Public Electronic Communications Network for the purchase of its services are not reasonable, BT may refuse to purchase those services without contravening the End-to-End Obligation. Conversely, where the terms and conditions (including charges) proposed by the TCP for the purchase of call termination are reasonable, BT has an obligation to purchase on those terms and conditions and at those charges.

*Disputes between BT and each of THUS, Band-X, Cable&Wireless, IV Response and Flextel*

- 6.7 Each of THUS, Band-X, Cable&Wireless, IV Response and Flextel has proposed rates for the termination of 0870 calls to BT.
- 6.8 BT rejected the rates proposed by each of THUS, Band-X, Cable&Wireless, IV Response and Flextel and is therefore refusing to purchase call termination on the terms and conditions proposed by each of those TCPs.
- 6.9 Therefore Ofcom considers that the End-to-End Obligation is applicable to the disputes between BT and each of THUS, Band-X, Cable&Wireless, IV Response and Flextel. Ofcom has therefore assessed whether the terms and conditions (including charges) proposed by each of the TCPs are reasonable, within the context of the End-to-End Obligation.

*Disputes between BT and the remaining TCPs*

- 6.10 In order for the End-to-End Obligation to be engaged, there must in effect be a refusal by BT to purchase. Ofcom considers that the issue of the 4 May 2007 OCCN by BT to each of the TCPs constitutes, in effect, a refusal by BT to continue to purchase at the existing charges. Put another way, BT's proposal of lower charges for call termination for 0870 numbers implies that BT would refuse to purchase call termination at any higher charge. In such a situation, the End-to-End Obligation would be engaged as BT would be effectively refusing to purchase wholesale narrowband call termination services at the existing charge levels.
- 6.11 In the context of the present dispute, Ofcom also considers that it is right to adopt this interpretation of the End-to-End Obligation. By contrast, if Ofcom were to adopt an overly narrow approach, that would suggest that the End-to-End Obligation could only be engaged where BT did not purchase call termination services (that is, BT failed to interconnect or ceased to exchange calls) from providers of Public Electronic Communications Networks, or where BT explicitly threatened to disconnect such networks. As a result, where BT considered an existing charge for call termination to be unreasonable, it would be required to disconnect (or at least threaten to disconnect) the terminating network from its own before a dispute could be brought to Ofcom under the End-to-End Obligation.

- 6.12 Such an outcome would be a bad one for consumers, who may no longer be able to make calls to the terminating network. Even more pertinently, that outcome would be directly inconsistent with the policy objective of the End-to-End Obligation, which is to ensure end-to-end connectivity for end users. If BT were required to disconnect or threaten to disconnect before the End-to-End Obligation were engaged, this would amount to a serious threat to end-to-end connectivity in the short term (specifically, pending Ofcom's resolution of a dispute).
- 6.13 Ofcom therefore considers that the End-to-End Obligation applies equally to each of the disputes and has considered whether the disputed charges (that is, the charges that BT has proposed to the TCPs in Annex 1 and also the charges that THUS, Band-X, Cable&Wireless, IV Response and Flextel have proposed to BT) are reasonable in each case. Ofcom has followed the same approach as that followed in *Determinations to resolve mobile call termination rate disputes between T-Mobile and BT, O2 and BT, Hutchison 3G and BT and BT and each of Hutchison 3G, Orange and Vodafone, 19 July 2007*<sup>17</sup> ('Mobile Termination Disputes').

### The approaches considered to resolve these disputes

- 6.14 Ofcom has considered the following approaches to assessing reasonableness in the context of these disputes:
- Develop an understanding of the extent to which BT obtain gains from trade on the basis of the disputed charges. In considering this, Ofcom has also considered the extent to which the risk of arbitrage opportunities would impact upon BT's ability to obtain gains from trade; and/or
  - Develop an understanding of the extent to which a TCP would obtain gains from trade on the basis of the disputed charges. As set out in Ofcom's statement of 27 March 2007 on *Mobile Call Termination* ("the MCT Statement"), "in resolving a dispute relating to the application of BT's end-to-end connectivity obligation, Ofcom would consider each dispute on its merits, in the light of the specific facts and circumstances and the arguments put to it by the parties, *including the reasonableness of any resolution on both parties*"<sup>18</sup>; and/or
  - Undertake a benchmarking analysis of relevant comparators and draw conclusions as to a reasonable termination charge based on those benchmarks.
- 6.15 The approach that Ofcom is taking in resolving these disputes is set out in paragraphs 6.19 onwards. In summary, Ofcom does not consider that it is informative to undertake a benchmarking analysis in assessing reasonableness in these disputes, because of a lack of relevant benchmarks. Ofcom does, however, carry out an examination of the extent to which BT and the TCPs obtain gains from trade at the disputed charges.
- 6.16 In considering BT's gains from trade, Ofcom has also considered how to resolve these disputes to achieve an outcome that is consistent with the NTS policy of restoring the geographic link for 0870 numbers. This is directly relevant because it

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<sup>17</sup> See [http://ofcom.org.uk/bulletins/comp\\_bull\\_index/comp\\_bull\\_ccases/closed\\_all/cw\\_942/deter.pdf](http://ofcom.org.uk/bulletins/comp_bull_index/comp_bull_ccases/closed_all/cw_942/deter.pdf)

<sup>18</sup> See [http://www.ofcom.org.uk/consult/condocs/mobile\\_call\\_term/statement/statement.pdf](http://www.ofcom.org.uk/consult/condocs/mobile_call_term/statement/statement.pdf) at paragraph 5.152

implies that the termination rate(s) determined by Ofcom should minimise the risk of undesirable arbitrage on a scale sufficient to negate BT's gains from trade, which would risk unravelling the geographic link and could lead to BT increasing its retail rates for calls to geographic numbers (and therefore calls to 0870 numbers) in order to reduce its losses arising from arbitrage.

### *Benchmarking to relevant comparators for the disputed termination charges*

6.17 Ofcom has considered whether benchmarking would be an informative approach and has identified and assessed the following options for a possible benchmarking analysis:

- The first option considered was benchmarking against geographic termination rates. Ofcom considered that this was not a suitable benchmark as geographic rates are not reflective of the routing and NTS costs involved in a call to an 0870 number.
- The second option was to benchmark against another non-geographic number range such as 0871 termination rates. However, Ofcom does not consider such benchmarks to be relevant in the present case since calls to 0870 numbers will no longer follow the same charging principles as those which apply to other non-geographic numbers subject to the NTS Condition following the changes to the regulatory regime. Under the NTS Condition, TCPs are able to determine the retail prices for 0870 calls with BT allowed to retain a proportion to cover its costs of origination. Following the changes to the regulatory regime, retail charges will be set by the OCP according to the level of termination charge payable. Termination charges for calls to non-geographic numbers other than 0870 would therefore not be a relevant benchmark in assessing the reasonableness of termination charges for calls to 0870 numbers following the changes to the applicable regulatory regime.

6.18 In light of the above, Ofcom has not relied on benchmarking analysis in assessing the reasonableness of the disputed charges under the End-to-End Obligation.

## **The approach to assessing 'reasonableness' in these disputes**

### *The extent to which BT obtain gains from trade on the basis of the disputed charges*

6.19 In assessing the reasonableness of a charge as part of a dispute based on BT's End-to-End Obligation, Ofcom has to strike the appropriate and proportionate balance between the expected benefits of its intervention and the expected costs.

6.20 Given the purpose of the End-to-End Obligation on BT, which is to ensure that connectivity is achieved, Ofcom considers that it is reasonable to require that BT purchase call termination from the TCPs in dispute so long as it obtains gains from the trade (subject to the no-arbitrage requirement discussed below).

6.21 Under a gains from trade test Ofcom examines whether BT makes a profit from connectivity with each TCP. Ofcom's approach involves comparing the revenues from 0870 calls with the incremental costs associated with BT originating and transiting calls to the network of each TCP.

## **BT revenues to be taken into account**

- 6.22 In assessing BT's revenues for the purposes of the gains from trade test in this case, Ofcom will need to determine what are the relevant revenues to be taken into account. It is not appropriate in this case to take account of actual revenues during the preceding years. This is because Ofcom is assessing the gains from trade which BT would make following the changes to the 0870 regime. When those changes come into effect, it will be possible for BT to raise its standard national call retail price to increase its revenues for calls to 0870 numbers or, alternatively, to introduce a free-to-caller price pre-announcement and charge a higher retail rate for charges to those numbers. Ofcom therefore needs to consider whether or not, in the present case, it is reasonable to calculate the revenues to be taken into account on the basis that BT could (i) raise its standard national call retail price or (ii) employ a free-to-caller price pre-announcement in order to increase its revenues.
- 6.23 Ofcom considers that it would not be reasonable to calculate BT's revenues on the basis that BT could increase revenues by increasing its standard national call retail price in the circumstances of the present disputes. If Ofcom were to do so, this would effectively require BT to raise its standard national call retail price thus restricting BT's commercial freedom in setting retail prices. No other CP would face the same constraint. Ofcom considers that such a measure would be disproportionate in the context of the present dispute. Ofcom therefore considers that it would not be reasonable in this case to require BT to calculate BT's revenues on the basis that BT could raise its standard national call rate above its current levels.
- 6.24 Ofcom also considers that it would not be reasonable to take into account revenues on the basis that BT could increase revenues by employing free-to-caller price pre-announcements for calls to 0870 numbers. Ofcom considers that such a measure would also restrict BT's commercial freedom in setting retail prices by effectively forcing it to price calls to 0870 numbers above the geographic retail rates. This would not apply to any other CP which would maintain freedom over the determination of retail prices. Ofcom considers that such a measure would be disproportionate in the context of the present dispute. Ofcom therefore considers that it would be unreasonable to assess BT's gains from trade on the basis of its ability to charge a retail price above the standard national call retail price for calls to 0870 numbers.
- 6.25 Ofcom has therefore sought to derive a notional forward looking revenue estimate from the date that the NTS regulatory changes relevant to 0870 are implemented, to reflect the geographic call rate link described above. To do this, BT has provided to Ofcom the following information:
- actual 0870 minutes made under national retail call plans by day evening and weekend rate periods;
  - revenues (£m) that would (notionally) be generated by 0870 calls during day, evening and weekend rate periods if they were priced at the published standard national call retail price (i.e. geographic call rate revenue multiplied by 0870 minutes); and
  - notional forward looking 0870 revenues on a ppm basis.
- 6.26 This information is presented in Table 2 further below.

- 6.27 BT's standard national call retail price is currently 7.91 ppm Daytime, 3.95 ppm Evening and 1.50 ppm Weekend. To conduct the gains from trade test for BT, Ofcom has therefore used a revenue estimate based on a weighted average of 0870 minute revenues according to Daytime, Evening and Weekend volumes.
- 6.28 Ofcom notes that, after the changes to the regulatory regime for 0870 are implemented, the inclusion of 0870 calls in retail call packages could mean that some 0870 calls made by consumers under BT Together Options 1, 2 and 3 would generate no marginal revenue for BT. To take account of this in the gains from trade test for BT, Ofcom used a revenue estimate obtained from BT which is a weighted average of 0870 minutes across BT Together Options 1, 2 and 3, including 0870 minutes across time of day rate periods where the marginal revenue is zero. Therefore, the average revenue estimates used in the gains from trade test for BT already reflect the fact that some 0870 calls would generate no marginal revenue for BT.
- 6.29 Ofcom also notes that 0870 calls are typically made during the daytime during office hours Monday to Friday. BT has stated that:
- 'Calls to 0870 numbers are predominantly to businesses using 0870 number ranges. Calls to businesses are mostly conducted during the daytime charging period and not during evening and week-ends which in BT Together Options can attract free to caller opportunities for consumers.'*
- 6.30 At these times (for BT Together Options 1 and 2) many 0870 minutes are at national geographic call rates (i.e. Daytime call) and hence, given current traffic patterns the impact of zero marginal revenue calls may be small.
- 6.31 In the gains from trade test for BT, Ofcom has also taken account of the possibility that the inclusion of 0870 calls in packages may stimulate volume growth to an extent which could threaten BT's gains from trade, by applying the 'no-arbitrage' test (set out in paragraphs 6.35 onwards).

#### **BT costs to be taken into account**

- 6.32 In applying a gains from trade test for BT Ofcom will assess whether the revenues received by BT would outweigh the incremental costs of providing 0870 calls to the TCPs at the proposed disputed charges such as to allow BT a gain from trade. Having determined the revenues to be taken into account, Ofcom must therefore determine the costs which it will take into account in its assessment. In conducting that assessment, Ofcom needs to first determine where responsibility for the payment of costs incurred in respect of a call to an 0870 number lies between BT (in its capacity as an OCP) and the TCPs, in particular interconnection charges, including transit (TWIX), IN DIP access and circuit charges.
- 6.33 As regards the measure of costs to be taken into account for the purposes of the gains from trade test, Ofcom considers that incremental costs are the relevant measure for this purpose. Incremental costs represent the costs that are directly attributable to the call volumes in question, and hence are relevant in assessing the incremental profitability of these call volumes. In other words, incremental costs are costs that would be avoided in the absence of those volumes. Fully Allocated Cost ('FAC'), by contrast, includes an allocation of common costs, which are costs that are not avoided if the volumes/service is not provided. FAC is therefore not the appropriate cost measure for this assessment.



- 6.34 If it can be shown, on the basis of the above, that BT would not be making a profit at the proposed charges, taking into account the potential for arbitrage, then Ofcom considers that the charges should be found to be unreasonable (in the context of the End-to-End Obligation). If, however, BT would derive gains from the trade with the TCP, that charge would not be unreasonable.

#### *The no-arbitrage ceiling*

- 6.35 However, the gains from trade test for BT will be affected by the ability of TCPs to offer revenue share such that arbitrage opportunities are created.<sup>19</sup> As discussed in paragraph 6.16, arbitrage is relevant to the consideration of the reasonableness of the disputed charges because if the charges are likely to facilitate arbitrage then BT may incur a loss since the termination charges it will be required to pay may exceed its retail revenues where an arbitrageur receiving a revenue share is using a call package to artificially inflate traffic on its 0870 numbers. In such situation, BT's marginal revenues are effectively zero. Ofcom has therefore conducted an assessment to determine the level of termination charges which minimises the risk of undesirable arbitrage. A charge above this level would risk BT incurring a loss and therefore such a charge would not be considered reasonable for the purposes of the End-to-End Obligation. This level of termination charges is referred to in this document as the 'no-arbitrage ceiling'.
- 6.36 For the purpose of deriving the no-arbitrage ceiling Ofcom has taken into account the costs of a TCP which is a network operator fully interconnected to BT's network.<sup>20</sup> Such a TCP will be interconnected with BT at many points. This means that the TCP will be able to take the call (from BT) at the near end (i.e. at the near end to the point of call origination), carry the traffic over its own network, and hand the call back to BT at the far end (i.e. close to the call destination). The network operator's costs will therefore reflect its own incremental costs of carrying traffic over its network. A TCP with fewer points of interconnection which would be required to purchase termination and conveyance from BT at BT's standard network charges, certain of which are subject to Network Charge Controls<sup>21</sup>. As the Network Charge Controls reflect BT's fully allocated costs (including an allowance for the cost of capital) and not LRIC (which are taken into account in the assessment of a fully interconnected TCP), Ofcom considers that a TCP purchasing conveyance and termination from BT will incur higher incremental costs than a fully interconnected network operator in terminating an 0870 call. Ofcom therefore considers that the costs of a full interconnected network operator represent the costs of an efficient operator for these purposes.
- 6.37 The no-arbitrage ceiling will determine a rate below which the risk of arbitrage occurring is negligible. Given Ofcom's objectives in removing 0870 from the scope of the NTS Condition to remove the regulatory support for revenue sharing giving rise to the risk of arbitrage, Ofcom considers that, subject to the assessment of whether or not a TCP would obtain gains from trade at that rate, a rate which is below the arbitrage ceiling would be reasonable.

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<sup>19</sup> See paragraphs 3.10 to 3.13 above describing arbitrage opportunities.

<sup>20</sup> There are approximately 70 points of interconnection with BT's fixed line network upon which charges for termination are based.

<sup>21</sup> [www.ofcom.org.uk](http://www.ofcom.org.uk)

### *Assessing gains from trade for the TCP*

- 6.38 Ofcom also recognises that, for a charge to be considered reasonable, there should be a gain from trade for the TCP, as set out in the MCT Statement (see paragraph 6.14 above). Applying a gains from trade test for the TCPs in this case means determining whether the TCPs would be making a profit (relative to incremental cost) on terminating 0870 calls originated by BT at the proposed disputed charges. If it can be shown that the TCPs would be making a profit at the proposed charges, then Ofcom considers that the charges should be found to be reasonable if also they pass the no-arbitrage test. If, however, the TCP would make no profit, or a loss, then it would appear that the TCP would derive no gains from the trade at the disputed rates and hence the charge would not be considered to be reasonable.
- 6.39 Ofcom considers that, in conducting this exercise, it is appropriate to consider the costs and revenues of an efficient island operator rather than those of a network operator which is full interconnected with BT. Ofcom defines an island operator as a TCP that has a minimal network (e.g. number translation equipment, interconnection circuits) and buys from BT such network conveyance services as it requires (for example geographic call termination). An island operator will be interconnected at only one point of interconnection with BT<sup>22</sup> (e.g. at the ST switch nearest the point of call origination). The island operator TCP will typically receive 0870 calls from BT (as OCP) at the single interconnection point, and will then translate (or map) the non-geographic 0870 number into a geographic number using its intelligent switch (or equivalent technology). In effect, the island operator terminates the 0870 call and then originates a new geographic call based on a new geographic number that corresponds to the terminated 0870 number in its database. The geographic call is then handed back to BT at the same point of interconnection for termination.
- 6.40 For the geographic leg of the call, the island operator buys termination from BT for the distance between its interconnection point with BT and the call destination. The incremental cost to the island operator of buying in the termination service reflects BT's standard charges which, where they are subject to the NCC, reflect BT's fully allocated costs (including an allowance for the cost of capital). The cost to the island operator will depend on the distance between the ST switch point of handover back to BT and the geographic call destination.
- 6.41 Ofcom considers it appropriate to consider the gains from trade test for a TCP from the perspective of an efficient island operator as, whilst its costs are likely to be higher than an efficient network operator fully interconnected with BT, those higher costs do not necessarily indicate that the island operator business model is inefficient, as the island operator may provide added value, possibly by serving different customer niches and so contribute to competition in NTS termination/hosting. Accordingly, Ofcom considers that it should not, in this dispute, determine a rate at which an efficient, albeit higher cost, island operator could not expect to earn a gain from trade. Ofcom has therefore determined a floor below which it would not be possible for an efficient island operator to obtain a gain from trade. Ofcom considers that the use of such a floor should ensure that all efficient TCPs are able to obtain a gain from trade since an island operator will typically have higher costs than those incurred by an operator with multiple points of interconnection with BT.

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<sup>22</sup> In practice, an island operator will have additional points of interconnection that may provide resilience to its termination service.

- 6.42 In considering the proposed rates, Ofcom is therefore of the view that if a proposed charge is below the floor set out above, it will not be a reasonable charge for the purposes of the End-to-End Obligation.
- 6.43 In summary, Ofcom's analysis can be broken down into 4 steps:
- i) Determine responsibility for payment of transit, Circuit Charges and IN DIP;
  - ii) Consider whether BT would obtain gains from trade on the basis of each of the disputed charges;
  - iii) Consider whether the disputed charges are at a level that is likely to facilitate revenue sharing and associated arbitrage opportunities; and
  - iv) Consider whether an efficient island TCP would obtain gains from trade on the basis of the disputed charges.

### **Step 1 – Responsibility for payment of IN DIP access, Transit Payments (TWIX) and circuit charges.**

- 6.44 As set out above, it is important in the context of the assessment of a reasonable charge to determine the costs to be taken into account in conducting the assessment of gains from trade for both BT and TCPs and also the no-arbitrage ceiling. Ofcom therefore needs to understand which elements of cost should be included in the cost stacks of BT (as an OCP) and the TCPs. As the changes to the regulatory regime will necessitate a change to the charging principles which applied under the NTC Condition, Ofcom has considered whether it is appropriate for a differing approach to be taken to the incurring of costs by operators under the new regime.
- 6.45 In determining whether the payment of the IN DIP, transit and circuit charges should be included in the costs incurred by BT or by the TCPs, Ofcom has had regard to the principles of cost recovery set out below and to the submissions of the parties. These principles were developed by Oftel in the context of number portability, endorsed by the Monopolies and Mergers Commission<sup>23</sup> and have subsequently been used by Ofcom in analysing various pricing issues.<sup>24</sup> These principles are as follows:
- **Cost causation:** the cost should be recovered from those whose actions cause the costs to be incurred at the margin;
  - **Distribution of benefits:** the costs should be recovered from the beneficiaries, especially where there are externalities;
  - **Practicability:** the mechanism for cost recovery needs to be practicable and relatively easy to implement;
  - **Effective competition:** the mechanism for cost recovery should not undermine or weaken the pressure for effective competition;

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<sup>23</sup> *Telephone Number Portability: A Report on a reference under s13 of the Telecommunications Act 1984* (MMC, 1995).

<sup>24</sup> See for example: *Determination under Section 190 of the Communications Act and Direction under Regulation 6(6) of the Telecommunications (Interconnection) regulations 1997 for resolving a dispute between Orange Personal Communications Services Ltd. ('Orange') and British Telecommunications plc ('BT') concerning the cost sharing arrangements for Customer Sited Interconnect ('CSI') links connection and rental charges*

- **Reciprocity:** where services are provided reciprocally, charges should also be reciprocal; and
- **Cost minimisation:** the mechanism for cost recovery should ensure that there are strong incentives to minimise costs.

#### *IN DIP costs*

- 6.46 IN DIP is an industry term for the translation of an NTS number into a geographic number to facilitate call termination on the destination number. Calls to 0870 number ranges will continue to require number translation after the changes to the regulatory regime applicable to the 0870 number range. This is an activity which is necessarily performed by the 0870 number range owner, to enable the call to be terminated on their network.
- 6.47 Ofcom considers that as this element is causal to the TCP providing a 0870 number and IN DIP is always undertaken in the TCP's network, this cost is the TCP's responsibility. Therefore, in accordance with the principle of cost causation, Ofcom considers that it is appropriate for costing DIP costs to be included in the costs of the TCP. This does not change the current situation.

#### *Transit Payments (TWIX)*

- 6.48 TWIX is the term for the transit charge levied by a transit operator for a call that is originated on the network of an OCP and routed via another operator's network for termination on the network of a TCP, where the transit operator is neither the OCP nor the TCP.
- 6.49 The current practice regarding the payment of transit charges for NTS calls varies by number range, with the TCP currently paying transit for 080X/0845/0870 calls and the OCP currently paying transit for 0844 and 0871.
- 6.50 Historically, the overriding principle of who bears responsibility for these costs was that the CP that retained the supernormal profit should pay for transit. Thus the OCP paid for transit for geographic calls as it received the retail revenue to originate the geographic call, and the TCP paid for transit for NTS calls as it received the retail revenue in respect of terminating the NTS call. Ofcom notes that OCPs will receive the retail revenue for calls to 0870 numbers, contrary to the current position under the NTS Condition whereby the TCP receives the retail revenue. Ofcom therefore considers that for the costs associated with the payment of transit charges should be included within the costs of BT as an OCP as OCPs will be the party to benefit from the additional revenues under the new regulatory framework. This is consistent with the principle of distribution of benefits.
- 6.51 In determining where responsibility for transit payments should lie, Ofcom has also considered, consistent with the principle of cost causation, which CP causes transit costs to be incurred. As it is the OCP that decides to route the call using a transit operator, it is a result of the OCP's actions that transit charges are incurred. Ofcom therefore considers that transit charges should be taken into account in an OCPs costs, in this case, BT.

#### *Circuit Charges*

- 6.52 The circuits in question are the interconnection circuits connecting the OCP's network to the TCP's network.

- 6.53 Ofcom notes that the current convention for NTS calls is that the TCP pays for the interconnection circuits, whilst for geographic calls the OCP pays for the interconnection circuits.
- 6.54 This is because under current NTS regulation, TCPs purchase origination from BT and as such the interconnection point between networks is deemed to be at the edge of BT's network. The TCP's network therefore extends to include the 'links' between networks (links provide the handover capacity from the BT network and the TCP's Points of Connection. They also include circuits which BT has installed for traffic management purposes where interconnection capacity sought by operators exceeded the limits BT had laid down for operator switched traffic through any one switch). For geographic calls BT purchases termination from the TCP and therefore the opposite applies, i.e. interconnection takes place at the 'edge' of the TCP's network and BT owns the 'links'.
- 6.55 Were Ofcom to follow this principle on respect of calls to 0870 numbers following the changes to the regulatory regime, it would appear appropriate to include circuit charges in the cost stack of OCPs since, under the new regulatory regime, a call to an 0870 number, from a regulatory perspective be analogous to a geographic call.
- 6.56 However, in considering circuit charges Ofcom has considered whether it would be practicable to depart from the current arrangements for NTS calls, where TCPs are responsible for circuit charges. Under the current arrangements, 0870 calls and all other NTS calls are conveyed over the same links. Ofcom understands that, were the responsibility for ownership of circuit charges for 0870 calls to change from TCPs to OCPs, OCPs would have to install additional links to carry 0870 traffic. This is because there is currently no basis for OCPs and TCPs to separate out the responsibility for charges associated with 0870 calls which are conveyed over these links from circuit charges associated with other NTS calls which are also conveyed over these links. Ofcom understands that the requirement for new links would be a non-trivial investment for OCPs.
- 6.57 Therefore Ofcom considers that, in the interests of practicability, circuit charges should be taken into account in the assessment of TCPs' costs.

## **Step 2 - BT's gains from trade on the basis of the disputed charges**

- 6.58 In carrying out a gains from trade analysis, Ofcom has used costs and revenues associated with calls to 0870 numbers by BT's retail customers originated on BT's network and terminated by another TCP (i.e. BT-TCP traffic). This approach corresponds to the nature of the dispute, in which payments by BT to TCPs for termination of BT's traffic are in dispute. Ofcom's analysis of costs and revenues excludes a consideration of 0870 traffic terminated by BT (including BT-BT).
- 6.59 In carrying out this test, information on costs and revenues associated with the provision of all calls by BT to TCPs was obtained from BT, including:
- FAC in £ p.a. for network and retail costs of BT's calls to TCPs for the financial years to 31 March 2006 and 31 March 2007;
  - Revenue in £ p.a. for calls handed over to TCPs, for the financial years to 31 March 2006 and 31 March 2007; and
  - The volume of 0870 traffic from BT to the TCPs, for the years to 31 March 2006 and 28 February 2007.

- 6.60 The results presented for the gains from trade test for BT as OCP in this section relate to the financial year ending 31 March 2007. Ofcom also undertook the test for the financial year ending 31 March 2006 and found the results to be consistent with those presented herein.

### Revenues

- 6.61 Ofcom sought forecasts of BT's volume forecasts for all or part of the period from which the new regulatory arrangements would apply to identify possible changes in demand for 0870 numbers arising from the changes to the 0870 NTS policy arrangements from February 2008. However, BT indicated that it could only provide trend data from February 2008 (i.e. projections based on past volumes), as it had not undertaken forecasts of volumes for the relevant period at that time. On this basis, Ofcom did not request this data since it would not have provided any insight into the demand response to the change in 0870 retail price.
- 6.62 Accordingly, in the absence of forecast volume data, Ofcom has assumed that 0870 volumes remain unchanged from 2006/07 levels.
- 6.63 Ofcom has then estimated notional revenues by taking 0870 volumes and multiplying by the average geographic revenue rate (after discounts) in ppm for 2006/07. BT has provided an estimated average geographic rate of ✂ppm, which is based on a weighting of 0870 traffic volumes under Options 1, 2, 3 and other BT price plans by day, evening and weekend rates at national geographic call prices.
- 6.64 Table 2 illustrates the relevant components used to derive a ppm average revenue

**Table 2 Estimated forward looking notional revenues**

	2006/07
Volumes (call minutes)	✂
Revenue (ppm)	✂
Total estimated revenue (£)	✂

Source: BT

### Costs

- 6.65 In relation to costs, BT provided Ofcom with information on the network and retail costs of providing 0870 BT-originated calls. Specifically, Ofcom sought the underlying costs (on an FAC basis) incurred for these services associated with BT's 0870 NTS network and retail costs, assuming traffic is handed over at the ST point of interconnection. As noted above, the relevant costs for which BT is responsible as an OCP include transit but not IN DIP or circuit charges which are the responsibility of the TCP.
- 6.66 In respect of network costs, Ofcom sought to identify the costs incurred by BT in respect of call origination and conveyance up to the ST point of handover, at which BT would hand traffic over to a TCP for conveyance and termination. Ofcom notes that these costs incurred by BT will be less where BT hands this traffic over to the TCP at the DLE, and will be more where BT hands the call over at later

interconnection points. To reflect this, Ofcom has sought to identify BT's costs of call origination for each point of handover to the TCP.

- 6.67 In relation to retail costs, Ofcom sought retail costs relating only to the costs of call origination. Ofcom sought retail costs that were broken down by key categories including Sales Goods and Administration ('SGA') costs and overhead costs. These costs were provided on a FAC basis. Ofcom has derived BT's LRIC costs from its FAC costs on the basis of a LRIC:FAC ratio of 50%. Ofcom considers it appropriate to apply such a ratio on the basis that the same reasoning would apply in the present case as was applied in Ofcom's determination of a dispute relating to mobile call termination charges.<sup>25</sup>
- 6.68 In that decision, Ofcom discounted BT's proposed LRIC:FAC ratio on the basis that it understood that BT derived these ratios from an analysis of the costs that BT considered to be incremental over a relatively large volume of call minutes, significantly larger than the volume of calls to each Mobile Network Operator but it is the latter which is the relevant increment to derive incremental costs in those disputes. In general, the larger the size of the volume increment, the larger the proportion of costs that are incremental.
- 6.69 For example, where there are economies of scale, the marginal costs (i.e. for a very small volume increment) are lower than the average costs. This had been noted in previous regulatory decisions, for example by Oftel in its Determination of fixed portability costs and charges and statutory consultation on proposed modifications to BT's Licence to give effect to charge controls for portability<sup>26</sup>.
- 6.70 Ofcom considered that economies of scale were likely to be present in both the network and retail costs relevant to the mobile call termination disputes. Based on previous analysis by Ofcom of similar costs such as in its analysis of the retail uplift for NTS call origination, Ofcom used a cost-volume elasticity ('CVE') of 0.25. The CVE, which is the percentage change in total cost for a given (small) change in volume, can equivalently be expressed as the ratio of marginal cost to average costs.
- 6.71 Based on the evidence available at the time, Ofcom's view was that BT's LRIC:FAC ratios were likely to overstate the ratios applicable to the relevant increment for the purposes of the mobile call termination disputes; the volume of calls to each MNO. Ofcom considered however that it was also likely that the CVEs understated the applicable ratios, because they embody a volume increment that may be too small. Ofcom's provisional view was that it would be reasonable to use ratios that lie mid-way between the ratios provided by BT and the CVEs previously used by Ofcom for similar costs in order to derive estimates of LRIC for the volume of calls to each MNO. In its modelling of the gains from trade, Ofcom therefore applied an average LRIC:FAC ratio for both network and retail costs of 0.50.
- 6.72 Ofcom considers that the same reasoning set out in that decision would also apply in this case since economies of scale are likely to be present in both the network and retail costs relevant to the current disputes and, in modelling of the gains from trade, Ofcom's provisional view is that the application of an average LRIC:FAC ratio for both network and retail costs of 0.50 is reasonable.

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<sup>25</sup> See

[http://www.ofcom.org.uk/bulletins/comp\\_bull\\_index/comp\\_bull\\_ccases/closed\\_all/cw\\_942/deter.pdf](http://www.ofcom.org.uk/bulletins/comp_bull_index/comp_bull_ccases/closed_all/cw_942/deter.pdf)

<sup>26</sup> See paragraph 11.13 in

<http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/2002/nupo0502.htm#ex>

- 6.73 Ofcom has identified that network costs vary depending on whether traffic is handed over earlier by BT (i.e. at the DLE) or handed over later (i.e. at Double Tandem – short, Double Tandem – medium, and Double Tandem – long). Clearly, where BT hands traffic over earlier, the costs of call origination will be less than at ST. Similarly, where traffic is handed over later, BT will incur higher costs of call origination.
- 6.74 Accordingly, Ofcom has estimated the costs incurred by BT at five points of interconnection (DLE, ST, Double Tandem – short, Double Tandem – medium, and Double Tandem – long) to be as set out in Table 3.

*Results of the gains from trade test for BT*

- 6.75 In considering whether BT obtains gains from trade at the disputed charges Ofcom first calculated the termination charge at which BT would break even and this is set out in Table 3 below.

**Table 3 Charge at which BT would break even (described in terms of the origination service on BT's network prior to handover)**

	DLE	Single Tandem	Dble plus Tandem Short	Dble plus Tandem Med	Dble plus Tandem Long
<b>2006/07</b>	ppm	ppm	ppm	ppm	ppm
<b>Revenue</b>	✂	✂	✂	✂	✂
<b>LRIC</b>					
Retail	✂	✂	✂	✂	✂
Network (to DLE)	✂	✂	✂	✂	✂
Network (ST)	✂	✂	✂	✂	✂
Network (DT-S)	✂	✂	✂	✂	✂
Network (DT-M)	✂	✂	✂	✂	✂
Network (DT-L)	✂	✂	✂	✂	✂
<b>Margin</b>	✂	✂	✂	✂	✂

- 6.76 In conducting the gains from trade test, Ofcom considers that, if a proposed charge would not allow BT to at least break even, BT would not obtain a gain from trade and that charge would not be reasonable. Ofcom has therefore assessed each of the proposed charges against the break even levels set out above in order to determine whether, on the basis of BT's gains from trade, such a charge would be unreasonable.
- 6.77 Table 4 below shows the results of applying the gains from trade test for BT's calls to each of the proposed charges. Ofcom has applied the test based on a volume weighted average of proposed termination charges for Day ('D'), Evening ('E') and Weekend ('W') rates. These weighted averages were then tested separately for DLE and ST points of interconnection.



**Table 4 Results of the gains from trade test on all traffic to each TCP (ppm)**

Operator	point of handover	D	E	W	Weighted average	test result	ppm margin
BT (OCP)	DLE Termination	0.3763	0.1756	0.1402	0.2789	Pass	✂
	ST Termination	0.2657	0.1249	0.1003	0.1974	Pass	✂
	ST Termination (Transit)	0.2657	0.1249	0.1003	0.1974	na	✂
THUS	Local Exchange	0.49617	0.22709	0.17885	0.3654	Pass	✂
	Single Tandem	0.38907	0.17809	0.14025	0.2866	Pass	✂
	Double Short	0.13917	0.06359	0.05015	0.1025	Pass	✂
	Double Medium	-0.03463	-0.01591	-0.01255	-0.0255	Pass	✂
	Double Long	-0.27433	-0.12571	-0.09895	-0.2021	Pass	✂
Band-X	DLE	✂	✂	✂	✂	Pass	✂
	ST	✂	✂	✂	✂	Pass	✂
C&W	At DLE (Base + LTC)	✂	✂	✂	✂	Pass	✂
	Base rate (DTS)	✂	✂	✂	✂	Pass	✂
	Incoming transit (Base)	✂	✂	✂	✂	na	✂
	Direct from OLO (Base + half transit)	✂	✂	✂	✂	na	✂
Flextel	ST	4	4	4	4.0000	Fail	✂
IVR	ST	1.5	1.5	1.5	1.5000	Pass	✂

Source: Ofcom, various operators

*Outcome in relation to charges proposed by BT, THUS, Band-X, Cable&Wireless, IV Response and Flextel*

- 6.78 On the basis of the above Table, the charges which have been proposed by Flextel would not be reasonable charges for the purposes of the End-to-End Obligation since they would not allow BT to obtain a gain from trade. Ofcom has not therefore considered these charges further in its analysis.
- 6.79 The charges proposed by each of IVResponse, Band-X, Cable&Wireless, THUS and BT would, in principle, allow BT to obtain a gain from trade and would therefore not, in principle, be unreasonable. However, as set out above at paragraphs 6.35 -6.37. Ofcom is of the view that, in assessing the gain from trade available to BT under the proposed charges, it is also appropriate to consider the risk that BT would be subject to arbitrage at the proposed termination charges. Ofcom has therefore conducted a further analysis of a modified gains from trade assessment in respect of BT as set out in Step 3.

**Step 3 - Consider whether the disputed charges are at a level that is likely to facilitate revenue sharing and arbitrage opportunities**

- 6.80 As noted above, arbitrage is a relevant consideration of the reasonableness of the disputed charges because if the charges are likely to facilitate arbitrage BT will incur a loss. Where this is the case, BT would not obtain a gain from trade at the proposed rates.
- 6.81 The charge ceilings identified in Step 2 above (i.e. below which BT obtains a gain from trade) do not take into account the risk of arbitrage, and assume that retail customers will make a payment to BT equal to the headline retail rate for national calls. If this were the case in reality, no arbitrage could occur since the retail costs to an arbitrageur would exceed the available TCP revenues such that any revenue share available to the arbitrageur would be insufficient to cover its costs. However, as previously discussed, in light of the inclusion of calls to 0870 numbers in flat rate call packages, the determination of a charge at the levels considered to be reasonable in principle in Step 2 may facilitate arbitrage as the retail costs payable by an arbitrageur would be significantly reduced. Ofcom has therefore conducted an assessment of the level of termination charges which minimise the risk of undesirable

arbitrage by ensuring that any outpayment available to arbitrageurs would be too low to provide arbitrage incentives.

- 6.82 In conducting its assessment and as set out at paragraphs 6.35 to 6.37 above, Ofcom has taken into account the costs of a TCP with full interconnection with BT. Ofcom has considered the routing costs and number translation costs which would be incurred by such a TCP to determine a level above which a TCP would be able to make an outpayment to a third party. Arbitrage will only occur, however, if the outpayment available is sufficient for an arbitrageur to cover its own costs and still make a profit. Ofcom has therefore also assessed the costs of an undertaking engaging in arbitrage activity.
- 6.83 The addition of these TCP and arbitrageur costs will lead to the determination of a ceiling above which it is possible for arbitrage to occur, since the level of outpayment would be sufficient for an arbitrageur to obtain a profit thus ensuring that the incentive to engage in arbitrage would be present.
- 6.84 The no-arbitrage ceiling must also allow for DLE handover along BT's network, at which traffic which is originated on BT's network is taken from BT's network. These points of handover are:
- DLE (ie local exchange), and;
  - ST.
- 6.85 In order to calculate the no-arbitrage ceiling Ofcom has taken into account three costs, namely:
- Routing costs;
  - Costs of number translation (including interconnection circuit costs); and
  - The costs of an arbitrageur engaging in pure 'artificial call stimulus' (ACS) activity.
- 6.86 By adding together the costs set out at paragraph 6.85, Ofcom has estimated a ceiling below which the revenue share available to the arbitrageur is so low that the incentives to arbitrage are minimised.

#### *Routing costs*

- 6.87 Ofcom has not attempted to estimate the incremental costs of a network operator using a bottom-up approach to costing a representative network. Ofcom has instead used a rule of thumb approach to estimate the geographic call termination costs of termination. First, Ofcom has taken BT's estimates of FAC costs (where published in BT's 2006/07 regulatory accounts) for local to tandem geographic termination services. Ofcom has converted BT's standard charges to LRIC using a FAC:LRIC ratio of 50 per cent (see below). Ofcom considers that these represent a reasonable proxy for the incremental costs to a network operator of carrying traffic over the local-tandem segment of its own network. Second, where FAC rates are not published by BT in their regulatory accounts (e.g. for inter-tandem conveyance), and where the conveyance elements reflect the relevant segments over which a network operator could carry that traffic over its network (e.g. excluding Call Termination Local Exchange segment), Ofcom has converted BT's standard charges to LRIC using a

FAC:LRIC ratio of 50 per cent. This latter approach to the assessment of LRIC costs is the same as that discussed in paragraphs 6.67 to 6.72.

- 6.88 Ofcom considers that this approach offers a reasonable guide to the incremental routing costs for a network operator.
- 6.89 TCPs will require termination for NTS calls which will require different distance related termination services.<sup>27</sup> Accordingly the costs of termination will need to be weighted by a representative traffic profile to ensure that they reflect the weighted average costs for all calls which require conveyance and termination.
- 6.90 In order to determine the payments an operator would make to BT for geographic call termination, Ofcom estimated the traffic weights that were relevant to the geographic leg of an 0870 call. To do this, Ofcom first estimated the size of the population that would be covered by each of BT's tandem switches at single-tandem rates. It then assumed that the TCP was interconnected to the tandem switch that provides the highest population coverage. This switch was found to have 13% of all fixed line connections as a proportion of all UK connections. Accordingly, Ofcom estimated that 13% of all NTS traffic would only require local –tandem conveyance. For the remaining double tandem termination payments to BT Ofcom used data provided by a single switch NTS operator and based upon their invoice data from BT to estimate the proportions of short, medium and long double tandem termination. This profile is set out below.<sup>28</sup>

**Table 5 Possible traffic weightings for estimating arbitrage ceiling**

Termination Service	Traffic weighting
DLE	0%
ST	13%
Double Tandem (short)	18%
Double Tandem (medium)	23%
Double Tandem (long)	46%

Source: Ofcom, an island operator

- 6.91 The traffic weightings above may be used to determine the routing costs of termination for handover to the TCP at a ST point of handover. This would be done by weighting the LRIC charges for own network conveyance for a network operator. By weighting the conveyance elements by traffic weights, Ofcom could then estimate a reasonable weighted average cost that an operator would need to cover in order to take its aggregate 0870 traffic at the ST point, and convey that call to its (various) destination(s).
- 6.92 However, Ofcom considers that these weightings should be adjusted to reflect the likelihood that TCPs that could potentially make outpayments to arbitrageurs which

<sup>27</sup> As noted above [insert para number], TCPs offering 0870 services will typically need to hand over 0870 calls to BT for conveyance, and sometimes also for the final leg of the call to the SP.

<sup>28</sup> The profile is taken as an average of actual traffic handed over to BT for geographic termination in August, September and October of 2007. Ofcom has then rebased these percentages to account for Ofcom's own estimate of local to tandem conveyance of 13 per cent.

locate their operations closer to BT's network strategically so as to reduce the distance based termination services (i.e. inter-tandem long conveyance) and therefore avoid incurring geographic termination costs. Accordingly, Ofcom proposes to adjust the profile so that all inter-tandem conveyance is assumed to be inter-tandem medium conveyance. Accordingly, it is assumed that no traffic is carried over inter-tandem short or long distances and hence these termination services are given a weight of zero. As Ofcom has already determined that 13% of all traffic is handled by a single tandem switch, the remaining 87% of traffic is all conveyed using inter-tandem (medium) conveyance.

**Table 6 Adjusted traffic weightings for estimating arbitrage ceiling**

Termination Service	Traffic weighting
DLE	0%
ST	13%
Double Tandem (short)	0%
Double Tandem (medium)	87%
Double Tandem (long)	0%

Source: Ofcom

- 6.93 To the extent this traffic profile (i.e. the weighted average geographic termination rate) does not vary by point of handover, then Ofcom will assess proposed termination rates against the no-arbitrage ceiling based on weighted geographic termination rates at the Single Tandem point of handover. Ofcom considers that in general, the distance that the OCP carries the call to the point of handover to the TCP is unlikely to affect the distance the TCP then carries the call to its final geographic destination. This is because the 0870 call destination is not known until it is handed over to the TCP for number translation, so the OCP will hand over the call at the point of interconnection with the TCP that is nearest to the origin of the call. It is therefore unlikely that the geographic termination profile would vary by point of handover, in most cases. For example, there is no a priori reason for a call that is originated and conveyed by the up to, say, a second tandem – long point of handover to require a different distance based termination service than where the call is handed over at the near end first tandem switch.
- 6.94 This means Ofcom will not separately assess proposed rates against ceilings estimated at second tandem (short, medium and long) points of handover, since these will not differ to the ceiling derived for Single Tandem in respect of weighted geographic termination rates.
- 6.95 The exception to this is handover at the DLE. In this case, the TCP will incur an additional cost to convey the call from the DLE to its NTS switch for number translation (it is not likely to have an NTS switch at each DLE). Ofcom therefore considers that it is relevant to estimate a separate ceiling to reflect the additional cost of call origination that would need to be incurred by the TCP when conveying the call from DLE to single tandem. This call origination cost is in addition to the geographic call termination costs incurred by the TCP in respect of the geographic leg of the call after the call reaches the single tandem point. The approach to estimating the additional cost is given in the Table 7 below.

**Table 7 Methodology for applying arbitrage ceiling at relevant points of interconnection**

<i>Point of handover (described in terms of the origination service on BT's network prior to handover)</i>	Arbitrage ceiling
DLE	baseline + Local-Tandem conveyance
ST	baseline

Source: BT carrier price list, Ofcom

6.96 Applying this methodology, Ofcom determines the weighted average geographic termination rates to be as set out in the following table:

**Table 8 Weighted geographic termination rates (ppm)**

<b><i>Geographic termination services</i></b>	<b>D</b>	<b>E</b>	<b>W</b>
Call Termination Local Exchange rate	0.2466	0.1129	0.0889
Single Tandem	0.3001	0.1374	0.1084
Double Tandem - Short	0.4251	0.1947	0.1535
Double Tandem - Medium	0.5120	0.2344	0.1848
Double Tandem - Long	0.6318	0.2893	0.2280
<b>Weighted geographic termination rate (ST point of handover)</b>	<b>0.48</b>	<b>0.22</b>	<b>0.17</b>
add Local Tandem Conveyance	0.0535	0.0245	0.0195
<b>Weighted geographic termination rate (DLE point of handover)</b>	<b>0.54</b>	<b>0.25</b>	<b>0.19</b>

Source: BT carrier price list, Ofcom

#### *Number translation*

6.97 Ofcom has estimated the costs of operating at a scale comparable to that of a larger provider of NTS termination services. Ofcom considers that those costs represent the efficient level of costs for number translation given the single point of interconnection that would be borne by a network operator supplying NTS termination/hosting. These costs have initially been estimated on a standalone costs (SAC) basis, that is, the total costs of a standalone business offering only NTS termination/hosting estimated on a bottom up basis, reflecting costs including:

- Intelligent switch costs;
- Interconnection cost; and
- Site costs.

- 6.98 Ofcom estimated the SAC of a network operator's cost based on the standalone costs of an island operator and then converted these costs to approximate the LRIC of the network operator (by applying a SAC:FAC ratio of 50 per cent, and then a further FAC:LRIC ratio of 50 per cent). See paragraphs 6.113 et seq for further detailed discussion.
- 6.99 As discussed earlier (see paragraphs 6.46-6.47 and 6.52-6.57), Ofcom has considered the costs relating to number translation that would also need to be recovered by the TCP, in addition to recovery of basic geographic call termination.
- 6.100 Ofcom has estimated the following costs to be relevant to providing a number translation service

**Table 9 NTS number translation related costs**

Operator costs (0845 and 0870 combined)	ppm (SAC)
Switch	✂
Site costs	✂
Operating and billing systems	✂
Interconnection circuit	✂
Number translation	✂
Operations and resources	✂
Total (SAC)	✂

Source, Ofcom, an Island operator

- 6.101 In respect of switch and number translation costs, Ofcom has estimated the standalone costs of number translation for network operator. Ofcom modelled an island operator where the intelligent switches are modelled to handle the volumes of traffic of by an operator with a market share similar to the larger TCPs. These standalone costs are then converted to a LRIC for a network operator as outlined below.

*The calculation of network translation costs for a network operator*

- 6.102 Ofcom has analysed the standalone number translation related costs of an island operator (i.e. costs presented in Table 9 above), and considers that with appropriate adjustments, Ofcom can, on a top down basis, develop an estimate of a network operator's number translation costs using an incremental cost standard (reflecting the long run number translation costs for the network operator).
- 6.103 As discussed further below, Ofcom takes the island operator costs and applies a two step methodology to convert that estimate to a network operator costs, by taking the island operator SAC costs and converting those costs to a FAC for a network operator, and then converting again to determine the network operator's LRIC.
- 6.104 The hypothetical island operator's infrastructure is modelled as not having a national network fully interconnected with that of BT. The rationale for this is that such a level

of infrastructure is possessed only by communications providers offering a broad range of services over their networks (e.g. BT and Cable&Wireless). It is highly unlikely that a firm offering only NTS call termination/hosting, even at BT's scale, would find it economic to build and maintain its own national network.

- 6.105 Ofcom's analysis therefore assumes that the island operator (terminating/hosting NTS calls) has a minimal network and buys from BT such network conveyance services as it requires (for example geographic call termination).
- 6.106 The island operator is modelled as having three interconnections (for network resilience) to one single BT Digital Main Switching Unit ('DMSU'), of which any two are of a sufficient size to carry all traffic. If one of the three routes into BT's network was to become unavailable (for example, because of problems in the ducting which contains the data cables) the hypothetical single product firm would be able to carry the same total volume of traffic via the remaining two routes.
- 6.107 In order to handle such volumes, Ofcom's model is based on 'carrier class' switches, i.e. the type of switch that would be used by large communications providers such as BT or Cable&Wireless. Although smaller providers of NTS call termination/hosting may use inexpensive PC-based switches, these components would not reliably be able to provide services at the scale being considered, both because of the volumes handled and the quality of service provided by large dedicated switches (which would be demanded by large NTS service provider customers for whom, as discussed above, continuity of service is likely to be business critical).
- 6.108 Ofcom determined that four suitably configured Ericsson AXE10 switches would be required to service the volume of traffic expected at the busiest periods. To provide a degree of resilience, the three-site configuration detailed above was modelled with two such switches at each site. This configuration provides a capacity of 50 per cent more than the peak traffic expected during high call traffic times enabling the network to cope with the failure of a single switch or of an entire site. Estimates of the various costs related to the sites (such as cabling and fire suppression) were also included in the model.
- 6.109 Ofcom's model also included the control software and hardware elements needed to provide NTS call termination/hosting. These include a service control platform ('SCP'), which directs the translation of NTS calls into geographic calls and provides some hosting services, such as automated voice response and intelligent routing. The model also included an interconnection billing system which records details about the ingress and egress of all calls and is used to verify payments from BT to the hypothetical single product firm for NTS call termination/hosting and the payments made by the hypothetical single product firm to BT for geographic call termination. These primary systems are located at one site with backups at another in case of site failure.
- 6.110 A significant element of the costs included in the model was the staff that would be needed to maintain, operate and develop the hypothetical single product firm's business. Provision was made for a dedicated team at each site, a central management team responsible for monitoring the island operator's services 24 hours a day, a team responsible for implementing technical projects and maintaining the core systems, and developers responsible for bespoke software projects (either to maintain and improve the SCP and associated software or to develop bespoke systems which customers may require).



- 6.111 A cost of capital of 11.4 per cent in pre-tax nominal terms was used to annuitise all the capital expenditure. This is the cost of capital that BT faces for regulatory purposes outside its copper access network (for which the rate is 10%), and it is used as a reasonable assumption in the absence of evidence that the cost of capital differs to reflect the specific characteristics of the NTS termination/hosting business. However, BT is a large multi-product business, with many income streams, and such favourable access to capital may not therefore be available to a smaller single-product firm.
- 6.112 On this basis Ofcom considers that the SAC for a network operator, based on a model of a standalone island operator to provide NTS termination hosting services, is approximately ~~8~~ppm.

#### Methodology to adjust to an estimate of LRIC for a network operator

- 6.113 In a multi-product firm, the incremental costs of a service are those costs which are directly caused by the provision of that service in addition to the other services which the firm also produces. Another way of expressing this is that the incremental costs of a service are the difference between the total costs in a situation where the service is provided and the costs in another situation where the service is not provided.
- 6.114 Incremental cost can be contrasted with the stand alone cost of a service which is the cost of providing that particular service on its own, and with common costs. Common costs are those which arise from the provision of a group of services but which are not incremental to the provision of any individual service. Where there are no common costs, incremental and stand alone costs are the same. Where there are common costs, the stand alone cost of a service is the sum of the incremental cost of the service plus all of the costs which are common between that service and other services. In this case there are said to be economies of scope, that is, total costs are reduced by producing a number of services together, because common costs then have to be incurred only once.
- 6.115 The island operator is by definition a stand alone business providing NTS termination/hosting services. Its (average total) costs may therefore be thought of as an approximation to the stand alone costs of NTS termination/hosting in multi-product firm such as an operator with a large network. Such an operator will be able to benefit from economies of scope by spreading common costs over a large range of services. Its average total costs ('fully-allocated' costs) will therefore be below SAC. In this determination Ofcom has assumed that FAC is roughly 50 per cent of SAC (see paragraphs 6.116-6.119). Similarly, incremental costs will be below FAC as the former include no common costs. Ofcom has followed the approach used in the Mobile Calls Termination disputes in assuming that incremental costs are 50 per cent of FAC (see paragraphs 6.67-6.72).
- 6.116 It is worth noting that in the analysis referred to above, Ofcom derived the SAC using an estimate a ratio of SAC to FAC based on an appropriate comparator. One that is readily available is the ratio of DSAC to FAC ratios based on BT network services in the relevant regulatory product groups, P056 and P346, which yields ratios in the region of 2.4 to 2.8. These comparators have two limitations: first, they relate to network rather than non-network costs, and second, they are based on DSAC not SAC.
- 6.117 In relation to the first of these points, economies of scale and scope may be greater for network services than for retail services, and the derived DSAC to FAC ratios could therefore overestimate the true DSAC to FAC ratio for non-network costs.



Having said that, economies of scale and scope in non-network functions are not negligible. For example, in the modelling used to inform the setting of BT's retail price controls in 2002<sup>29</sup> and in the NTS Retail Uplift in 2005 Ofcom used a cost-volume elasticity (the ratio of the percentage change in costs to the percentage change in output causing it) of 0.25 for retail costs (apart from bad debt which varies directly with revenue) while in other cases Ofcom has used a CVE of around 0.45 for indirect costs.<sup>30</sup> These CVEs reflect significant economies of scale in these activities (or, equivalently economies of scope in the services which the functions support).

- 6.118 In relation to the second point, on the other hand, it is likely that DSAC is below the true SAC for any given service, for the reasons set out above, namely that intra-business common costs are distributed among all the services to which they are common (rather than added to the incremental costs of just the service in question, as required for a true SAC). As a result, the DSAC:FAC ratios referred to above could lead to an underestimate of SAC for non-network expenditure.
- 6.119 Ofcom considers that a SAC:FAC ratio of 50% is an appropriate adjustment to make for a network operator. In turn, Ofcom considers the LRIC cost standard is the relevant standard for the arbitrage ceiling test for a network operator and hence applies an additional adjustment to reflect a FAC:LRIC ratio of 50 per cent. Accordingly, Ofcom estimates the NTS translation related costs to be approximately ✂ppm for the network operator.

**Table 10 Network related number translation costs (ppm)**

	<b>SAC</b>	<b>SAC:FAC</b>	<b>FAC:IC</b>
Adjustment ratio		50%	50%
ppm cost	✂	✂	✂

Source: Ofcom, island operator

- 6.120 Ofcom notes that a proportion of network related number translation costs relate to switching and interconnection circuit costs, for which costs could be said to be determined by peak capacity requirements. For the purpose of applying the no arbitrage ceiling test, Ofcom has applied a time of day gradient to allow for a proportionately greater share of these costs to be recovered in the daytime period. This gradient is based on the relativities of geographic termination rates as set out in Table 12.
- 6.121 Ofcom has also considered the relevant retail costs that would be borne by a network operator providing NTS termination/hosting. In its estimate for those costs, Ofcom included a minimal set of costs including sales team and support costs, marketing costs and premises costs. Ofcom estimates that a network operator would incur costs of approximately ✂ppm.

<sup>29</sup> See 'Protecting consumers by promoting competition: Oftel's conclusions -20 June 2002'

<sup>30</sup> See for example 'Determination of fixed portability costs and charges and statutory consultation on proposed modifications to BT's Licence to give effect to charge controls for portability', May 2002 or 'Wholesale Line Rental: Reviewing and setting charge ceilings for WLR services', November 2005

**Table 11 Retail related number translation costs**

	<b>SAC</b>	<b>SAC:FAC</b>	<b>FAC:IC</b>
Adjustment ratio		50%	50%
ppm cost	✂	✂	✂

Source: Ofcom

6.122 Ofcom considers in that deriving the network operator's number translation related costs (both network and retail), the adjustments used to convert the original SAC estimates of the island operator to LRIC are approximate only, reflecting Ofcom's judgement in respect of these relationships. Accordingly, there is a potential for a margin of error around the estimates. However, these cost estimates are based on the best available information to Ofcom, and on that basis Ofcom considers that it is reasonable to use these estimates in determining a termination rate.

#### *Costs of an arbitrageur*

6.123 Ofcom has identified the minimum costs incurred by an arbitrageur engaged solely in arbitrage activity, which it would need to more than cover with an outpayment from the TCP in order to make the arbitrage activity worthwhile.

6.124 As discussed earlier at paragraphs 6.35-6.37, Ofcom considers that in addition to the recovery of basic call routing and number translation costs by the TCP, arbitrage will only be incentivised where the proposed termination rates additionally allow the arbitrageur to cover its costs of business activity and retain an additional profit.

6.125 Ofcom has sought to identify a least cost operation that would provide a reasonable minimum cost that an arbitrageur would need to cover in order to be profitable.

6.126 ✂

6.127 ✂

6.128 ✂

**Figure 6 Diagram of SP business engaging in arbitrage**

✂

6.129 ✂.

6.130 ✂

6.131 ✂.<sup>31</sup>

6.132 ✂.

6.133 ✂

6.134 ✂

6.135 Where the total cost is divided by the total minutes, Ofcom has been able to estimate a ppm cost to an arbitrageur of engaging in such an activity. The estimated costs of and arbitrageur of engaging in such activity using this approach is therefore **0.12ppm**

#### *Conclusion*

6.136 As outlined in this section, the no-arbitrage ceiling comprises 3 key elements:

- Routing costs (blended for various distance based termination services at Day, Evening and Weekend time of day rates);
- Number translation costs; and
- Costs of an arbitrageur engaging in arbitrage activity.

6.137 The relevant no-arbitrage ceilings for two interconnection points of handover, and for time of day period are therefore as follows:

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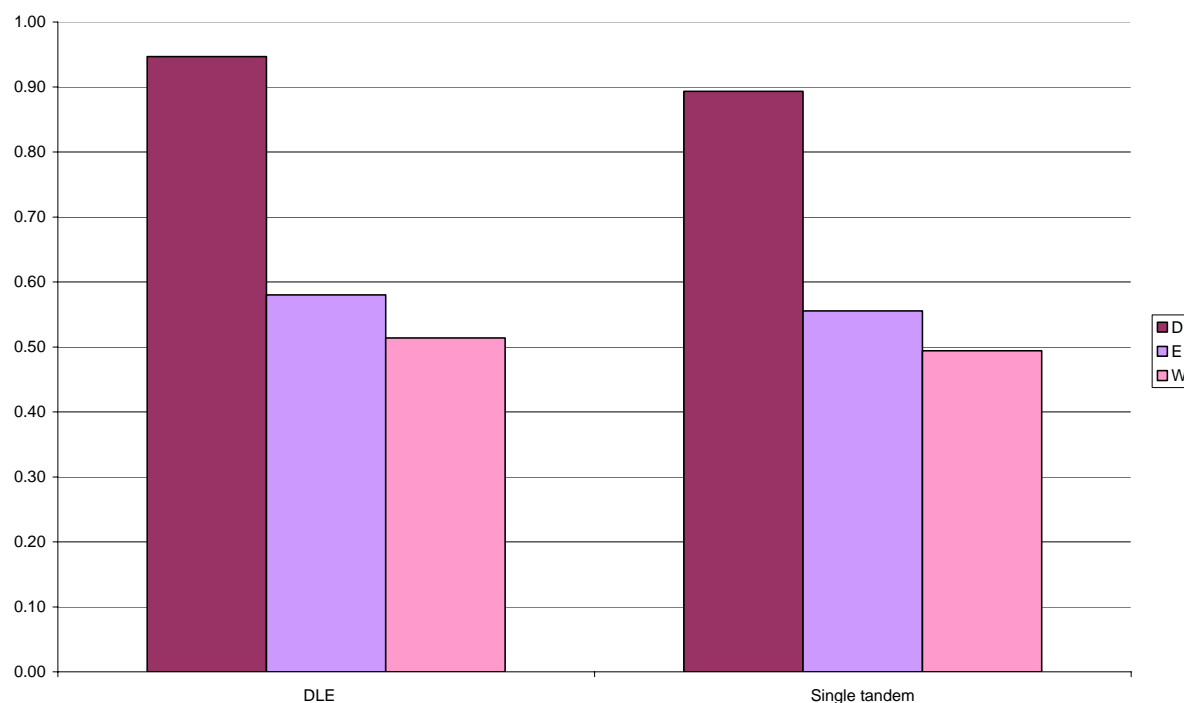
<sup>31</sup> This gives the lower boundary of costs for making the calls, since an arbitrageur would seek to avoid detection under Artificially Inflated Traffic restrictions, which would require periodically changing the nature of the activity to avoid detection, which would entail additional cost.

**Table 12 No-arbitrage ceilings (ppm)**

<i>Elements of ceiling</i>	<b>D</b>	<b>E</b>	<b>W</b>
weighted geographic routing costs (ST point)	0.48	0.22	0.17
number translation (network)	✂	✂	✂
number translation (retail)	✂	✂	✂
arbitrageur costs	0.12	0.12	0.12
<b>Single Tandem no-arbitrage ceiling</b>	<b>0.89</b>	<b>0.56</b>	<b>0.49</b>
Add Local Tandem Conveyance	0.05	0.02	0.02
<b>DLE no-arbitrage ceiling</b>	<b>0.95</b>	<b>0.58</b>	<b>0.51</b>

6.138 The relevant no-arbitrage ceilings for each interconnection point of handover, and for time of day period are also graphed below:

**Figure 7 No-arbitrage ceilings (ppm)**



Source: Ofcom

6.139 In order to assess the reasonableness of the disputed charges, Ofcom has compared the proposed charges to the no-arbitrage ceilings set out in Figure 7 above. Where a proposed charge is below the ceiling, Ofcom considers that, subject to the assessment of whether a TCP would obtain a gain from trade at that rate, such a charge may be considered reasonable.

**Table 13 Results: Comparing proposed 0870 termination rates against the no-arbitrage ceiling**

Operator	point of handover	D	E	W	D	E	W	overall result
BT (OCP)	DLE Termination	0.3763	0.1756	0.1402	Pass	Pass	Pass	Pass
	ST Termination	0.2657	0.1249	0.1003	Pass	Pass	Pass	Pass
	ST Termination (Transit)	0.2657	0.1249	0.1003	na	na	na	na
THUS	Local Exchange	0.49617	0.22709	0.17885	Pass	Pass	Pass	Pass
	Single Tandem	0.38907	0.17809	0.14025	Pass	Pass	Pass	Pass
Band-X	DLE	✂	✂	✂	Fail	Fail	Fail	Fail
	ST	✂	✂	✂	Fail	Fail	Pass	Fail
C&W	At DLE (Base + LTC)	✂	✂	✂	Pass	Pass	Pass	Pass
	Base rate (DTS)	✂	✂	✂	Pass	Pass	Pass	Pass
	Incoming transit (Base)	✂	✂	✂	na	na	na	na
	Direct from OLO (Base + half transit)	✂	✂	✂	na	na	na	na
Flextel	ST	4	4	4	Fail	Fail	Fail	Fail
IVR	ST	1.5	1.5	1.5	Fail	Fail	Fail	Fail

Source: various operators, Ofcom

6.140 As set out at Table 13 above, the termination rates proposed by IVResonse and Band-X are in excess of the no-arbitrage ceiling. Ofcom therefore considers that those rates would not allow BT to obtain a gain from trade and, as a result, are unreasonable charges for the purposes of the End-to-End Obligation.

6.141 The termination rates proposed by BT, THUS and Cable&Wireless are below the no-arbitrage ceiling and would therefore ensure that BT obtained a gain from trade at the proposed rates. Ofcom therefore considers that, subject to the assessment of whether those charges would allow a TCP to obtain a gain from trade, those rates are reasonable rates for the purposes of the End-to-End Obligation.

6.142 However, in assessing whether or not the proposed charges are reasonable, Ofcom also considers it appropriate to ensure that the proposed charges also allow a TCP to obtain a gain from trade.

#### **Step 4 - TCP's gains from trade on the basis of the disputed charges**

6.143 Ofcom considers that where TCPs have made their own proposals for termination charges, it could be argued that these rates allow them to make a gain from trade, since they would not suggest a rate which did not allow them a gain from trade on the basis of their own costs. This might apply to the rates proposed by BT (as an OCP), THUS and Cable&Wireless which meet the no-arbitrage ceiling above.

6.144 However, as set out above at paragraphs 6.39 to 6.41 above, Ofcom considers that, in conducting an assessment of whether or not a TCP obtains a gain from trade, it is appropriate to take into account an efficient island operator rather than a network operator with a number of points of interconnection with BT. The rates proposed by BT, C&W, THUS and Cable & Wireless may reflect the lower costs of their operation due to deeper interconnection with BT. As certain of the TCPs in dispute are island operators and not all TCPs have made their own proposals, Ofcom has therefore also separately estimated a ladder of termination charges below which an efficient island operator TCP could not make a gain from trade.

- 6.145 In conducting the assessment, Ofcom has assessed the costs of an efficient island operator. Ofcom considers that, where the proposed charge would allow such an operator to obtain sufficient revenues to cover its costs, the TCP will be able to obtain a gain from trade and that charge will therefore be considered reasonable.
- 6.146 Ofcom has used BT's standard charges for wholesale network termination services to calculate an island operator's incremental geographic call termination costs. These are the costs that this type of operator would actually pay to terminate the geographic leg of an 0870 call, as they have no conveyance network of their own. Although BT's standard charges usually reflect BT's own fully allocated costs, as stated above, the charges are incremental to the island operator, since it buys in the service from BT.
- 6.147 Ofcom has first estimated the costs of geographic termination for handover by the TCP at a ST point of handover. This is done by weighting the standard charges at which an island operator buys in termination. By weighting the conveyance elements by traffic weights, Ofcom has estimated a reasonable weighted average cost that an operator would need to cover in order to take its aggregate 0870 traffic at the ST point, and convey that call to its (various) destination(s). The weighted cost of geographic termination is as follows:

**Table 14 Geographic cost floor for weighted handover of traffic at ST point (ppm)**

<b>Geographic termination services</b>	<b>D</b>	<b>E</b>	<b>W</b>
Call Termination Local Exchange rate	0.2466	0.1129	0.0889
Single Tandem	0.3537	0.1619	0.1275
Double tandem - Short	0.6018	0.2755	0.2169
Double tandem - Medium	0.7774	0.3559	0.2803
Double tandem - Long	1.0171	0.4657	0.3667
<b>Gains from trade floor for ST handover</b>	<b>0.80</b>	<b>0.37</b>	<b>0.29</b>

Source: BT carrier price list, Ofcom

- 6.148 Ofcom has not taken into account the costs associated with number translation related costs such as circuit charges in its assessment of proposed termination rates against the gains from trade test for TCPs. This is because the GFT test seeks to establish the lowest termination charge at which TCPs could make a gain from trade, taking into account the fact that they have two potential sources of revenue for NTS termination services: the termination charge paid by the OCP, and any charges paid by the SP which is using the particular 0870 number. Ofcom considers that it is possible that TCPs could seek to recover the costs associated with the NTS service, such as circuit costs and the IN DIP, from the SP that is benefiting from the number translation service. Therefore, in order to make a gain from trade, the TCPs should at a minimum be able to recover the costs of the geographic termination, excluding NTS costs, from the OCP. These geographic termination costs are included in the TCPs gains from trade test. NTS related costs are excluded from the test, for the purposes of this Determination.
- 6.149 Ofcom has then identified the relevant geographic call termination costs for where the traffic is handed over at different interconnection points. Ofcom has calculated

the ladder of figures depending on whether the call is handed over at the DLE or Single Tandem.

6.150 Ofcom has identified the additional conveyance charges which must be added or subtracted to reflect the differences in costs incurred by operators in routing calls to their NTS switch depending upon the level at which they interconnect with BT. Ofcom has taken as a starting point for estimating those costs BT's charges for conveyance on the basis set out in Table 15.

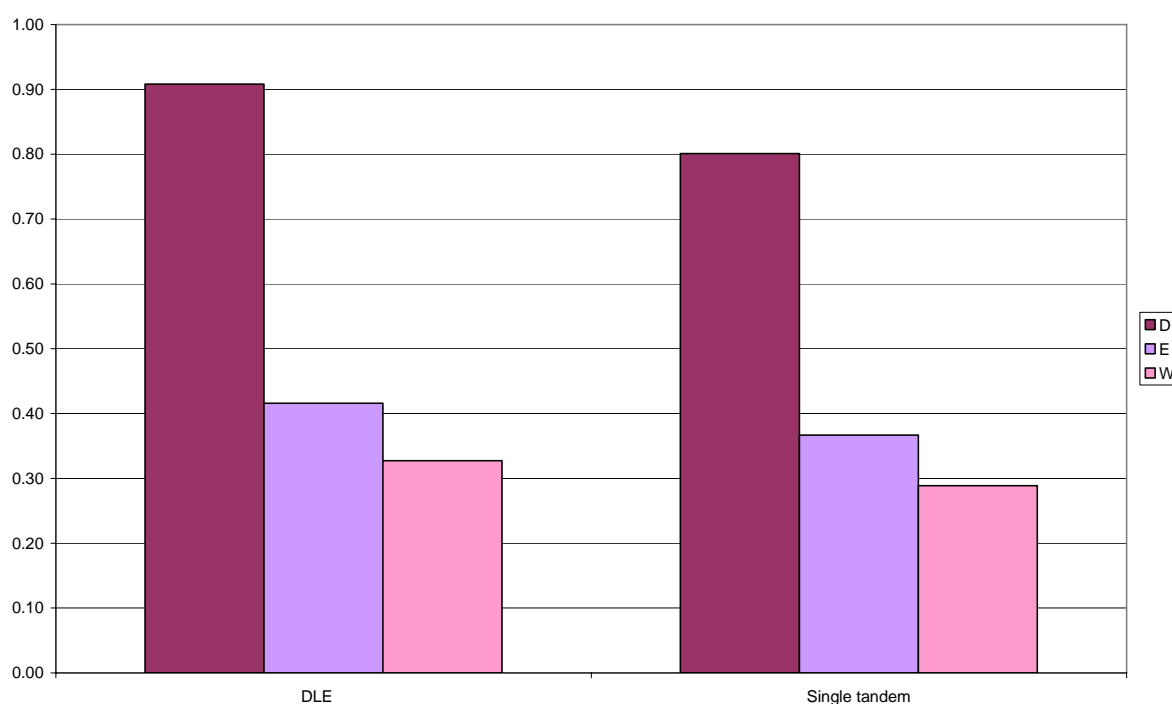
6.151 The relevant gains from trade floor for two interconnection points of handover, and for time of day period are therefore as follows for the island operator.

**Table 15 Gains from trade floors (ppm)**

<i>Point of handover (described in terms of the origination service on BT's network prior to handover)</i>	D	E	W
DLE (adding Local-Tandem conveyance)	0.91	0.42	0.33
Single Tandem	0.80	0.37	0.29

6.152 The relevant gains from trade floors for two interconnection points of handover, and for time of day period are shown below as a graph.

**Figure 8 Gains from trade floors (ppm)**



- 6.153 In determining whether or not the proposed rates are reasonable charges for the purposes of the End-to-End Obligation, Ofcom has compared the proposed rates against the floors set out in Figure 8 above and the results set out in Table 16, show that none of the proposed rates which passed the no-arbitrage test (ie BT, THUS and Cable&Wireless) would also enable an efficient (island) operator to earn a gain from trade.

**Table 16 Results: Comparing proposed 0870 termination rates against the geographic termination cost floor (ppm)**

Operator	point of handover	D	E	W	D	E	W	overall result
BT (OCP)	DLE Termination	0.3763	0.1756	0.1402	Fail	Fail	Fail	Fail
	ST Termination	0.2657	0.1249	0.1003	Fail	Fail	Fail	Fail
	ST Termination (Transit)	0.2657	0.1249	0.1003	na	na	na	na
THUS	Local Exchange	0.49617	0.22709	0.17885	Fail	Fail	Fail	Fail
	Single Tandem	0.38907	0.17809	0.14025	Fail	Fail	Fail	Fail
Band-X	DLE	✂	✂	✂	Pass	Pass	Pass	Pass
	ST	✂	✂	✂	Pass	Pass	Pass	Pass
C&W	At DLE (Base + LTC)	✂	✂	✂	Fail	Fail	Fail	Fail
	Base rate (DTS)	✂	✂	✂	Fail	Fail	Fail	Fail
	Incoming transit (Base)	✂	✂	✂	na	na	na	na
	Direct from OLO (Base + half transit)	✂	✂	✂	na	na	na	na
Flextel	ST	4	4	4	Pass	Pass	Pass	Pass
IVR	ST	1.5	1.5	1.5	Pass	Pass	Pass	Pass

Source: Various operators, Ofcom

### Conclusion

- 6.154 None of the rates proposed which would allow BT to obtain a gain from trade would pass the gains from trade test for an island TCP. Those rates may not therefore be considered to be reasonable charges for the purposes of the End-to-End Obligation.

## Conclusion

- 6.155 Ofcom has not been able to determine that any of the proposed charges for termination of calls to 0870 numbers are reasonable charges for the purposes of the End to End Obligation. Ofcom has therefore considered the appropriate rate at which the termination rate should be set in this scenario.
- 6.156 In the present case, Ofcom has determined that the charge at which an island operator TCP would obtain a gain from trade would be **0.80 ppm** for ST daytime. The corresponding network operator no-arbitrage ceiling has been determined to be **0.89 ppm**. Moreover, the network operator no-arbitrage ceiling lies above the island operator gains from trade floor for all points of handover and for daytime, evening and weekend rates.
- 6.157 Ofcom considers that in the present disputes, any charge between 0.80ppm and 0.89ppm for ST Daytime call to 0870 numbers would be a reasonable charge for the purposes of the End-to-End obligation. Where operators interconnect with BT at different levels the reasonable levels are those set out below:

**Table 17 Proposed range of 0870 NTS termination rates for various points of handover (ppm)**



<i>Point of handover (described in terms of the origination service on BT's network prior to handover)</i>	day		evening		weekend	
	floor	ceiling	floor	ceiling	floor	ceiling
Single Tandem	0.80	0.89	0.37	0.56	0.29	0.49
DLE	0.91	0.95	0.42	0.58	0.33	0.51

- 6.158 Under the End-to-End Obligation, BT is required to purchase narrowband call termination at a reasonable charge. In light of Ofcom's conclusion as to the level of a reasonable charge, BT is therefore required to purchase termination at any rate which corresponds to the levels set out in Table 17 above. However, all the proposed rates for the purchase of termination of calls to 0870 numbers lie outside the range of rates which Ofcom has considered would be reasonable charges.
- 6.159 In light of this, Ofcom considers that it is appropriate, taking into account the objectives of the End-to-End Obligation to require BT to purchase termination of calls at the upper end of the range set out in Table 17. Ofcom considers that, in light of its reasoning set out in this draft determination, BT would be required to purchase at the higher rate if it were to receive such a proposal from a TCP. If Ofcom were to determine a lower rate than that rate, Ofcom considers that it is inevitable that TCPs would seek to obtain the highest rate considered reasonable for the purposes of the End-to-End Obligation. In order to avoid further disputes therefore, Ofcom is proposing to direct BT to enter into a transaction with the TCPs listed at Annex 1 and 2 for the purchase of termination of calls to 0870 numbers at the charges set out in Table 17
- 6.160 In applying this reasoning, Ofcom considers that the correct balance is struck between minimising the risk of potential arbitrage and ensuring that an efficient operator is able to make a gain from trade.
- 6.161 Ofcom recognises that, at the present time, it is not possible to determine the exact date on which those charges should take effect as between the charges since those charges will only be applicable from the time at which changes to the regulatory regime for calls to 0870 numbers come into effect. As set out at paragraphs 3.14 to 3.15 above, the date for the implementation of those changes is not yet known. Ofcom is therefore proposing that its determination would come into effect on the date on which the changes to the regulatory regime are also to come into effect.
- 6.162 Ofcom recognises that this approach may lead to a reassessment of the reasonableness of the charges which are the subject of these disputes since Ofcom's assessment includes a consideration of BT's current charges for network conveyance. Those charges are reviewed annually on 1 April and Ofcom's basis for the calculation of the charges set out in Table 17 above may therefore no longer be applicable as from 1 April 2008 if the changes to the regulatory regime for calls to 0870 numbers did not enter into force prior to this date.
- 6.163 In order to assist the parties to the dispute, Ofcom has therefore set out in Annex 3 a formula for the calculation of the charge which Ofcom would consider to be reasonable in the event that BT's charges for network conveyance were to change.

## **Annex 1 TCPs referred by BT on 7 July 2007**

Affiniti Integrated Solution Limited
Cable & Wireless U.K.
Cheers International Telecom Limited
Colloquium Limited
COLT Telecommunications
Energis Communications Limited
Easynet Group
Magrathea Telecommunications Limited
Opal Telecom Limited
Opera Telecom Ltd
Redstone Communications Limited
Syntec UK Limited
Thus plc
Tiscali UK Limited

## Annex 2 TCPs referred by BT on 6 August 2007

1RT Group Limited
Aggregated Telecom Limited
Band-X Limited
Flexitel Limited
Gamma Telecom Holdings Limited
GMK Telecom Ltd
Inclarity plc
Interweb Design Limited
IV Response Limited
PNC Telecom
Prodigy Internet Limited
Sala Trading Ltd
Skytel Limited
Telxl Limited
Vectone Network Limited

### Annex 3 Formula

A6.1 This Annex sets out the formula to derive the maximum allowable 0870 termination charges.

#### ***Gains from trade test (OCP)***

A6.2 Ofcom's gains from trade test for BT is to ensure that at the proposed termination rates, BT can make a gain from trade, ie

$$GFT > 0$$

Where  $GFT$  is BT's gain from trade and:

$$GFT = R - T - C$$

Where:

$R$  is the aggregate revenue from 0870 calls to other communications providers that would have been earned had calls been charge at national call rates;

$T$  represents the proposed termination rates that BT would pay to other communications providers for termination of 0870 calls;

$C$  is the aggregate network and retail costs incurred by BT in originating 0870 calls to other communications providers.

#### **Break-even charges**

A6.3 A break even charge, above which BT could not make a gain from trade, i.e.,

$GFT(ceiling)$  is derived for BT-originated 0870 calls to other

communications providers, broken down to a separate service  $S$  for each of the following options points of call handover:

- DLE
- Single Tandem
- Double Tandem - short
- Double Tandem - medium
- Double Tandem - long

$$GFT(ceiling)_S = \frac{R_S - C_S}{V_S}$$

Where:

$V_S$  is the volume of calls for service  $S$

Such that:

$$GFT_S > 0$$

#### **No-arbitrage ceiling**

A6.4 The following equations set out the method for deriving the no-arbitrage ceiling. There are two steps.

A6.5 First, we calculate the traffic weighted average cost of termination for handover by the OCP to the TCP at a single tandem (ST) point:

$$\begin{aligned} AC_n = & \\ & DLE_n \times V_n^{DLE} + \\ & DLE_n \times V_n^{DLE} + LT(FAC) \times LRICAdj \times V^{LT} + \\ & DLE_n \times V_n^{DLE} + LT(FAC)_n \times LRICAdj \times V^{LT} + DTS_n \times LRICAdj \times V_n^{DTS} + \\ & DLE_n \times V_n^{DLE} + LT(FAC)_n \times LRICAdj \times V^{LT} + DTM_n \times LRICAdj \times V_n^{DTM} + \\ & DLE_n \times V_n^{DLE} + LT(FAC)_n \times LRICAdj \times V_n^{LT} + DTL_n \times LRICAdj \times V_n^{DTL} + \\ & NT_n + \end{aligned}$$

$$R +$$

## *ARBITRAGE*

= ceiling for Single Tandem (i.e. baseline)

where

n = day, evening, weekend rate (in ppm)

where geographic termination services are defined as follows

DLE = BT call termination local exchange rate

LT (FAC) = local-tandem conveyance rate (BT Regulatory accounts)

DTS = BT inter tandem – short rate (<100kms)

DTM = BT inter tandem – medium rate (100km-200kms)

DTL = BT inter tandem – long rate (> 200kms)

A6.6 Charges for geographic termination services are taken from BT's carrier price list and BT's regulatory accounts as set out in Table 1.

**Table 1 Relevant incremental termination service charges**

	Termination service	Charges at BT standard rates effective in 2007/07 in ppm (BT carrier price list except where stated otherwise)		
Abbrev.		n=D	n=E	n=W
DLE	Call termination local exchange	0.2466	0.1129	0.0889
LT (FAC)	local-tandem conveyance	0.0535	0.0245	0.0195
DTS	Inter-Tandem conveyance - short	0.1250	0.0573	0.0451
DTM	Inter-Tandem conveyance - medium	0.2119	0.0970	0.0764
DTL	Inter-Tandem conveyance - long	0.3317	0.1519	0.1196

A6.7 Ofcom sets out the cumulative termination service charges in Table 2.

**Table 2 Relevant cumulative termination service charges**

	Termination service	Charges at BT standard rates effective in 2007/07 in ppm (BT carrier price list except where stated otherwise)		
Abbrev.		n=D	n=E	n=W
DLE	Call termination local exchange	0.2466	0.1129	0.0889
LT (FAC)	Single Tandem	0.3001	0.1374	0.1084
DTS	Double Tandem - short	0.4242	0.1942	0.1531
DTM	Double Tandem - medium	0.5120	0.2344	0.1848
DTL	Double Tandem - long	0.6318	0.2893	0.2280

A6.8  $LRIC_{adj} = 0.5$




A6.9 Volume weights are set out below

$V^{DLE}$  = volume of traffic for DLE  
 $V^{LT}$  = volume traffic weight for LT  
 $V^{DTS}$  = volume traffic weight for DTS  
 $V^{DTM}$  = volume traffic weight for DTM  
 $V^{DTL}$  = volume traffic weight for DTL

where:

$V^{DLE}$  = 0%  
 $V^{LT}$  = 13%  
 $V^{DTS}$  = 0%  
 $V^{DTM}$  = 87%  
 $V^{DTL}$  = 0%

A6.10  $NT_n =$

N=D	N=E	N=W
		

A6.11  $R = \text{red scissors icon}$

A6.12 ARBITRAGE (arbitrageur costs) = 0.12ppm

A6.13 Ofcom has also determined a ladder of ceilings based on BT's standard charges to reflect the differences in distances that traffic is carried over, depending on point of handover.

A6.14 Ofcom then derives a ceiling for each of the following 2 points of handover

Point of handover	Arbitrage ceiling
DLE	baseline + LT

Single tandem	baseline
---------------	----------

**Gains from trade test (TCP)**

A6.15 Ofcom has also derived a gains from trade test for TCPs.

$$\begin{aligned}
 GFT_n = & \\
 & DLE_n \times V_n^{DLE} + \\
 & DLE_n \times V_n^{DLE} + LT \times V^{LT} + \\
 & DLE_n \times V_n^{DLE} + LT \times V^{LT} + DTS_n \times V_n^{DTS} + \\
 & DLE_n \times V_n^{DLE} + LT \times V^{LT} + DTM_n \times V_n^{DTM} + \\
 & DLE_n \times V_n^{DLE} + LT \times V^{LT} + DTL_n \times V_n^{DTL}
 \end{aligned}$$

= floor for Single Tandem (i.e. baseline)

where

n = day, evening, weekend rate (in ppm)

where geographic termination services are defined as follows

DLE = BT call termination local exchange rate

LT = BT local-tandem conveyance rate

DTS = BT inter tandem – short rate (<100kms)

DTM = BT inter tandem – medium rate (100km-200kms)

DTL = BT inter tandem – long rate (> 200kms)

A6.16 Charges for geographic termination services are taken from BT's carrier price list as set out in Table 3.



**Table 4 Relevant incremental termination service charges**

	Termination service	Charges at BT standard rates effective 2006/07 in ppm		
Abbrev.		n=D	n=E	n=W
DLE	Call termination local exchange	0.2466	0.1129	0.0889
LT	local-tandem conveyance	0.1071	0.0490	0.0386
DTS	Inter Tandem conveyance - short	0.2481	0.1136	0.0894
DTM	Inter Tandem conveyance - medium	0.4237	0.1940	0.1528
DTL	Inter Tandem conveyance - long	0.6634	0.3038	0.2392

A6.17 Ofcom sets out the cumulative conveyance charges below.

**Table 4 Relevant termination service charges**

	Termination service	Charges at BT standard rates effective 2006/07 in ppm		
Abbrev.		n=D	n=E	n=W
DLE	Call termination local exchange	0.2466	0.1129	0.0889
LT	Single Tandem	0.3537	0.1619	0.1275
DTS	Double Tandem - short	0.6018	0.2755	0.2169
DTM	Double Tandem - medium	0.7774	0.3559	0.2803
DTL	Double Tandem - long	1.0171	0.4657	0.3667

A6.18 Volume weights are set out below

$V^{DLE}$  = volume of traffic for DLE  
 $V^{LT}$  = volume traffic weight for LT  
 $V^{DTS}$  = volume traffic weight for DTS  
 $V^{DTM}$  = volume traffic weight for DTM  
 $V^{DTL}$  = volume traffic weight for DTL

where:

$V^{DLE}$  = 0%  
 $V^{LT}$  = 13%  
 $V^{DTS}$  = 18%  
 $V^{DTM}$  = 23%  
 $V^{DTL}$  = 46%

A6.19 Ofcom has also determined a ladder of floors based on BT's standard charges to reflect the differences in distances that traffic is carried over, depending on point of handover.

A6.20 Ofcom then derives a floor for each of the following 2 points of handover

Point of handover	gains from trade floor
DLE	baseline + LT
Single tandem	baseline

### Ofcom's decision rule

A6.21 For single tandem (ST) handover, where at least one proposed termination rate (in ppm) satisfies all three of the following tests:

gains from trade breakeven ceiling (ie below)

$$GFT(ceiling)$$

no arbitrage ceiling (ie below)

$$AC$$

and gains from trade floor (ie above)

$$GFT(floor)$$

Ofcom will determine the maximum proposed rate to satisfy the no-arbitrage ceiling and gains from trade floor tests to be the maximum reasonable termination rate for day, evening and weekend rate periods. That is:

Where  $GFT(floor) \leq T^i \leq AC$

And  $T^i \leq GFT(ceiling)$

where  $T^i$  is the proposed termination rate for day, evening, and weekend periods and i represents each operator proposing a termination rate.

Then the maximum reasonable termination rate (MRTR):

$$MRTR = MAX(T^i)$$

A6.22 Where no proposed termination rates satisfy all three tests, then the maximum of the no arbitrage ceiling and the gains from trade floor will be determined to be the maximum reasonable termination rate. That is:

where  $T^i \geq GFT(ceiling)$

or  $T^i \geq AC$

or  $GFT(floor) \geq T^i \leq AC$  .

Then where  $GFT(floor) \geq AC$

$$MRTR = GFT(floor)$$

Where  $GFT(floor) \leq AC$

$$MRTR = AC$$

A6.23 Ofcom will determine a maximum reasonable termination rate for DLE handover by adding the cost borne by the TCP for local tandem conveyance to that point of handover.

where  $MRTR = GFT(floor)$

then for DLE handover

$$MRTR = GFT(floor) + LT(FAC)$$

where  $MRTR = AC$

Then for DLE handover

$$MRTR = AC + LT_n$$

**Table 1: Relevant termination service charges**

<b>Abbrev.</b>	<b>Conveyance service</b>	<b>D</b>	<b>E</b>	<b>W</b>
LT (FAC)	Local tandem (FAC)	0.1071	0.0490	0.0386
LT	Local tandem	0.0535	0.0245	0.0195

## Annex 4

# Responding to this consultation

## How to respond

- A6.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 30 November 2007**.
- A6.2 Ofcom strongly prefers to receive responses using the online web form at <http://www.ofcom.org.uk/consult/condocs/XXXX>, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A6.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email [tanya.rofani@ofcom.org.uk](mailto:tanya.rofani@ofcom.org.uk) attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A6.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.
- Tanya Rofani  
Competition Group  
Riverside House  
2A Southwark Bridge Road  
London SE1 9HA
- Fax: 020 7981 3333
- A6.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A6.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex X. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

## Further information

- A6.7 If you want to discuss the issues and questions raised in this draft determination, or need advice on the appropriate form of response, please contact Tanya Rofani on 020 7783 4342.

## Confidentiality

- A6.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, [www.ofcom.org.uk](http://www.ofcom.org.uk), ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

- A6.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A6.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/about/accoun/disclaimer/>

### Next steps

- A6.11 Following the end of the consultation period, Ofcom intends to publish a final determination by 28 December 2007.
- A6.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: [http://www.ofcom.org.uk/static/subscribe/select\\_list.htm](http://www.ofcom.org.uk/static/subscribe/select_list.htm)

### Ofcom's consultation processes

- A6.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A6.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at [consult@ofcom.org.uk](mailto:consult@ofcom.org.uk) . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A6.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash  
Ofcom  
Sutherland House  
149 St. Vincent Street  
Glasgow G2 5NW

Tel: 0141 229 7401  
Fax: 0141 229 7433

Email [vicki.nash@ofcom.org.uk](mailto:vicki.nash@ofcom.org.uk)

## Annex 5

# Ofcom's consultation principles

- A6.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

### Before the consultation

- A6.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

### During the consultation

- A6.3 We will be clear about who we are consulting, why, on what questions and for how long.
- A6.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.
- A6.5 We will normally allow ten weeks for responses to consultations on issues of general interest.
- A6.6 There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organizations interested in the outcome of our decisions. This individual (who we call the consultation champion) will also be the main person to contact with views on the way we run our consultations.
- A6.7 If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

### After the consultation

- A6.8 We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

## Annex 6

# Consultation response cover sheet

- A6.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, [www.ofcom.org.uk](http://www.ofcom.org.uk).
- A6.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A6.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A6.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at [www.ofcom.org.uk/consult/](http://www.ofcom.org.uk/consult/).
- A6.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.



## Cover sheet for response to an Ofcom consultation

### BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

### CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing

☐

Name/contact details/job title

☐

Whole response

☐

Organisation

☐

Part of the response

☐

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

### DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

☐

Name

Signed (if hard copy)

