

April 30, 2014

Ex Parte

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: WC Docket No. 05-25, RM-10593

Dear Ms. Dortch:

On April 28, 2014, Charles McKee and Chris Frentrup of Sprint Corporation (“Sprint”), Stan Besen and Bridger Mitchell, Gil Strobel of Lawler, Metzger, Keeney & Logan, LLC, and my colleague Jennifer Bagg and I met with Deena Shetler, Eric Ralph, Belinda Nixon, Betsy McIntyre, William Layton, Christopher Koves, Ken Lynch and Susan Lee of the Federal Communications Commission’s (“FCC” or “Commission”) Wireline Competition Bureau and Jack Erb of the FCC’s Office of Strategic Planning and Policy Analysis to discuss the above-captioned proceedings.

At the meeting, Sprint discussed the Commission’s forthcoming analysis of the provision of special access services and ways to ensure that the final analysis is as complete and accurate as possible. Sprint discussed the Commission’s plan to supplement its structural market analysis with an econometric analysis.¹ Sprint discussed the impact of non-linear price schedules, individually-tailored and blended pricing, and loyalty provisions on the econometric analysis.²

¹ See *Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Service*, Report and Order and Further Notice of Proposed Rulemaking, FCC 12-153, 27 FCC Rcd. 16,318, 16,349 ¶ 71 (2012) (“The one-time, multi-faceted market analysis [incorporates] a structural market analysis, but it also goes further by supplementing the analysis with econometrically sound panel regressions to determine how the intensity of competition (or lack thereof), whether actual or potential, affects prices, controlling for all other factors that affect prices.”).

² Sprint explained that the issues regarding barriers to entry arising from ILEC loyalty discount programs have been analyzed in detail throughout this proceeding. See, e.g., Reply Declaration of Joseph Farrell on Behalf of CompTel, WC Docket No. 05-25, RM-10593 (filed July 29, 2005) (Attachment to Reply Comments of CompTel, Global Crossing North America, Inc. and NuVox Communications), attached to this filing. See also Stanley M. Besen & Bridger M. Mitchell, *Anticompetitive Provisions of ILEC Special Access*

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As a result of these and other characteristics of special access services, Sprint explained that taking terms and conditions into account will be important. Sprint noted that undertaking multiple analyses of the marketplace will ensure the Commission has a solid basis for action.

Sprint also discussed the approach used by Ofcom to analyze the provision of similar services in the United Kingdom and urged the Commission to undertake a similar analysis of relatively narrow product and geographic markets. Sprint stated that the data collection should allow the Commission, like Ofcom, to gain important insight into the extent to which new competitors are entering relevant markets, the number of competitors with facilities within a certain distance of ILEC wire centers, and the barriers to switching between traditional interface and alternative interface services like Ethernet. Finally, Sprint emphasized that the Commission should continue to focus on the existence of market power and the reasonableness of rates, terms and conditions regardless of whether TDM or Ethernet technology is being used in the provision of special access services. Sprint distributed Ofcom's summary of its study, which is included here as an attachment.

Pursuant to the Commission's rules, this letter is being submitted for inclusion in the public record of the above-captioned proceedings.

Sincerely,

/s/ Paul Margie

Paul Margie
Counsel to Sprint Corporation

cc: meeting participants

Arrangements, WC Docket No. 05-25, RM-10593 (filed Feb. 11, 2013) (Attachment to Comments of BT Americans Inc., Cbeyond Communications, LLC, EarthLink, Inc., Integra Telecom, Inc., Level 3 Communications, LLC and tw telecom inc.).

Attachment 1

Reply Declaration of Joseph Farrell on Behalf of CompTel

Attachment to Reply Comments of CompTel, Global Crossing North
America, Inc. and NuVox Communications, WC Docket No. 05-25,
RM-10593 (filed July 29, 2005)

Reply Declaration of Joseph Farrell

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Special Access Rates for Price Cap Local Exchange Carriers)	WC Docket No. 05-25
)	
AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services)	RM No. 10593
)	

**Reply Declaration of
Joseph Farrell
On Behalf of CompTel**

I. Qualifications

1. I am Professor of Economics, Affiliate Professor of Business, and Chair of the Competition Policy Center at the University of California at Berkeley. Among other non-university professional activities, I was Chief Economist at the FCC in 1996-1997, President of the Industrial Organization Society in 1996, Editor of the *Journal of Industrial Economics* in 1995-2000, Deputy Assistant Attorney General and chief economist at the Antitrust Division of the US Department of Justice in 2000-2001, and member of the National Academies of Science Computer Science and Telecommunications Board in 2001-2004. I am a Fellow of the Econometric Society and a member of the Editorial Board of the journal *Information Economics and Policy*.

II. Overview

2. I begin by explaining why incumbent termination charges and certain kinds of optional volume or loyalty discounts are likely to exacerbate problems arising from well-known barriers to entry, especially when the inducement for customers to subscribe to these optional plans includes raising the price of the alternative,

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e.g., setting excessive basic rates for month-to-month service. I then discuss the use of price and cost information for assessing competition in this market, and comment in particular on the Declaration of Dr William Taylor.

III. Effects of ILEC Contracts on Competition

3. Economic and structural barriers to competitive entry into the special access market are well known and well documented. Ordover and Willig summarized several such barriers in a declaration submitted along with AT&T's petition that launched this proceeding.¹ Special access services are characterized by economies of scale and sunk costs, as well as substantial incumbent first-mover advantages such as rights-of-way and building access. As a result, competitive entry generally has been restricted to the highest capacity services provided in dense metropolitan areas. Any further impediments to entry, such as the ILEC contract provisions I describe below, exacerbate these inherent economic and operational barriers.

4. Among such incremental impediments to entry would be (a) excessive charges (typically payable by the customer) for terminating ILEC service, (b) commitments to purchase some minimum amount from the incumbent, with substantial penalties for non-compliance, and (c) any provisions such as volume or loyalty discounts under which a special access consumer pays the ILEC more for something else (such as service at another location) if it uses an entrant rather than ILEC special access in one location. For many customers on a discount plan, the basic month-to-month tariff may be the next-most preferred alternative. When the basic month-to-month plan specifies prices significantly above the competitive level, these discounted prices (and discounted prices in other plans) can also be above competitive levels. Moreover, when a monopoly offers proportional or relative discounts off its undiscounted prices in order to induce customers to agree to exclusionary provisions, it has an incentive to set the undiscounted price above even the monopoly level (because, rather than simply

¹ In the Matter of AT&T Corp. Petition for Rulemaking To Reform Regulation Of Incumbent Local Exchange Carrier Rates For Interstate Special Access Services, RM No. 10593. Declaration of Janusz A. Ordover and Robert D. Willig in support of AT&T's Petition, at ¶¶38-45.

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- detering demand, an increase above the monopoly level steers customers into the discount plans and also brings the discount prices closer to the monopoly level).² Thus, even if they have other efficiency rationales, such pricing schemes put an additional wedge into the incentive for the customer to contract with a competitive carrier whose long-run cost is below the ILEC's price.³ They thus weaken entry as a constraint on an incumbent's overall price level, whether or not they fall into standard antitrust categories such as predatory pricing or tying.
5. ILECs have implemented such pricing schemes in their special access tariffs. SBC's "Managed Value Plan" ("MVP") Tariff is an example. The MVP is an umbrella plan. Customers purchasing a wide range of special access products can include several such purchases in the MVP, which provides discounts in addition to term and volume discounts contained in the underlying tariffs from which customers purchase the special access circuits that they include in the MVP. The MVP discounts increase each year (9% in the 1st year, 11% in the 2nd, 12% in the 3rd, 13% in the 4th, and 14% in the 5th year). Carriers must spend at least \$10 million annually on SBC special access services to be eligible.⁴ The MVP establishes a "Minimum Annual Revenue Commitment" (MARC) that the carrier must maintain with SBC for the five-year term. The MARC is established when the carrier joins the MVP by taking a carrier's previous three months' billing for qualified services (defined as virtually all SBC transport services) multiplied by four.

² The economics of price-setting once a subset of customers become entitled to a percentage discount off a list price are analyzed by Borenstein, Severin, 1996. "Settling for Coupons: Discount Contracts as Compensation and Punishment in Antitrust Lawsuits," *Journal of Law & Economics*, University of Chicago Press, vol. 39(2), pages 379-404. Professor Borenstein shows that such discounts do not lower prices overall but rather implement a transfer from non-discount customers to discount customers, with almost no effect on average price or on the seller's profit. Moreover, if entitlement to the discount is based on agreeing to exclusionary terms, such arrangements further harm consumers in the long run. In price flex areas, even basic tariffs are unregulated, and the rates in these tariffs can be, and have been, increased by the ILEC.

³ The basic economics here were explored in the well-known article by Aghion, Philippe and Bolton, Patrick. "Contracts as a Barrier to Entry," *American Economic Review*, June 1987. 77(3), pp. 388-401. See also Joseph Farrell, "Deconstructing Chicago on Exclusive Dealing," *Antitrust Bulletin*, forthcoming, available at <http://repositories.cdlib.org/iber/cpc/CPC05-053/>. In particular, I explain there why discounts to customers in return for signing exclusive or exclusionary contracts may not make the customers better off.

⁴ If the customer has a national footprint, it must meet the \$10 million minimum in each SBC region.

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6. Carriers receive the MVP discount on services purchased up to their MARC. The discount does not apply to services purchased in excess of the MARC unless the MARC is increased. The MARC can be increased (semi-annually, by a minimum of 5%), but cannot be decreased during the term of the MVP.
7. The MVP requires carriers to purchase at least 95% of their SBC transport services from SBC’s interstate tariff, restricting their purchases of UNEs to less than 5%. (Recent tariff contract filings include a higher requirement of 98%)⁵.
8. If a carrier fails to meet the MARC, it must either continue the contract and pay a shortfall penalty equal to the difference between its MARC and the actual amount spent, or terminate its contract and pay a termination penalty. For example, if the carrier terminates during year 3 of the plan, it pays 12.5% of the MARC for the remainder of year 3 and the remaining years of the agreement. The customer is also billed for any nonrecurring charges that were waived under the MVP agreement.
9. The termination penalty requires repayment of all MVP discounts received in the six months preceding the termination date plus a specified percentage of the MARC for the remainder of the term (10% if in year 1 or year 5, otherwise 12.5%). The table below lays out the termination penalties for a carrier with a MARC of \$20 million that terminates its agreement at the beginning of a year. The table assumes that a discount was earned in each of the previous 6 months.

Year in which termination occurs:	Current MVP Discount Rate	Discount Earned in Previous 6 Months	% of Remaining Commitment Due	Remaining Commitment Due	Total Penalty	Penalty (In Months)
1	9%	\$0	10.0%	\$10,000,000	\$10,000,000	6.0
2	11%	\$900,000	12.5%	\$10,000,000	\$10,900,000	6.5
3	12%	\$1,100,000	12.5%	\$7,500,000	\$8,600,000	5.2
4	13%	\$1,200,000	12.5%	\$5,000,000	\$6,200,000	3.7
5	14%	\$1,300,000	10.0%	\$2,000,000	\$3,300,000	2.0

10. The Remaining Commitment Due is calculated as the MARC over the remaining years of the contract times the penalty rate (labeled “% of Remaining

⁵ See e.g. SWBT Tariff FCC No. 73, Section 41.31.

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Commitment Due”). The total penalty is the sum of the Remaining Commitment Due and any discount earned in the previous 6 months. In the first two years of the contract, the penalty amounts to more than 50% of the annual MARC. In the last year, it falls to about 15% of the annual MARC. In addition to this penalty, the customer may incur termination penalties specified in the underlying tariff for the services included in the MVP. In some cases, these penalties amount to 40% of the monthly recurring rate over the remaining term of the tariff.⁶

11. The MVP is structured in a way that can make it unprofitable for a competitor to win any modest portion of a customer’s business, even if the incumbent’s price exceeds the competitor’s long-run cost. Essentially, it sets up an automatic and sometimes drastic price cut for any portion of the customer’s business that the customer is considering switching to a competitor. For example, consider a customer that spends \$20 million on special access services supplied by SBC. The customer can either 1) sign the MVP contract and purchase \$20 million in special access services from SBC or 2) purchase 20% of its services from a CLEC and 80% from SBC. In scenario 1), the carrier receives an average 11.8% discount (ignoring discounting) from SBC over the length of the contract;⁷ thus its total expenditure is \$17.64 million per year. In scenario 2), the carrier would not be able to enter into an MVP agreement because the MARC is based on 100% of historical revenues. Thus, for the 80% of its special access requirements that it purchased from SBC, the customer would spend \$16 million. The carrier would save money in this scenario only if the competitive carrier charged less than \$1.64 million for the remaining 20% of the customer’s demand, a discount of 59% off SBC’s \$4 million price before MVP discounts.
12. Once an MVP agreement is signed, the marginal price of special access services for special access spending up to the MARC is zero, because a customer that misses the MARC is required to make up the shortfall by paying a penalty. The marginal price if the total spending is above the MARC is SBC’s rate before the

⁶ Southwestern Bell Telephone Company, Tariff F.C.C. No. 73, 2nd Revised Page 7-68.3.5.

⁷ The 11.8% average discount is the arithmetic mean of the discounts of 9%, 11%, 12%, 13% and 14% offered in each of the five years of SBC’s MVP.

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MVP discount is deducted (unless the MARC is increased). Because the MARC cannot be decreased, a customer whose demand does not grow cannot switch to a competitive carrier for part or all of its special access spending without incurring significant penalties.

13. A customer with increasing expenditures on special access may find it economical to use a competitor to serve its new demand. Consider the example of a customer that entered into an MVP agreement with a MARC of \$20 million. Suppose that the customer established business in a new area, requiring special access services worth \$10 million in that area. The carrier could either include this new demand for special access service in its MARC, increasing the MARC by \$10 million, and then receive the 11.8% average discount on this new commitment; or else it could go to a competitor that would only need to offer the 11.8% discount off SBC's pre-MVP prices to match the discount offered by the MVP plan.
14. However, if this \$10 million in new growth in the network occurs at the same time as a reduction of \$2 million in the customer's original footprint, then the situation changes. In this case, the first \$2 million of the new growth would cost the customer nothing if it used SBC, since the customer had a commitment to spend \$20 million on SBC's special access services. If all the new business went to SBC, the MARC could be increased to \$28 million and the discounted payment would be \$24.696 million. If the customer wanted to use a non-ILEC provider for the entire \$10 million of new growth business, it would still have to maintain the \$20 million MARC commitment and, with \$18 million spent on special access purchased from SBC, it would not receive any MVP discount. Thus, it would pay \$20 million to SBC. Using the non-ILEC provider would be lower cost only if its total price for the new growth was less than \$4.7 million, a 53% discount off SBC's (pre-MVP) prices of \$10 million. In other words, the rival must beat a price that is less than half of the ILEC's pre-MVP price.
15. Thus in some circumstances a customer switching a part of its business to a non-ILEC provider could lose not only the discount on the portion switched, but also the MVP discount on the portion that remained with the ILEC. When the

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competitor cannot win the entire business (if, for example, it has loops to some but not to all of the customer's locations), it is effectively foreclosed from serving that customer.

16. As a result, the MVP and similar pricing plans can have the effect of requiring a competitive carrier to beat a marginal price that is well below the average price that special access customers pay the ILEC. That is, the ILEC can charge a price (11.8% below its pre-MVP price) that is well above a competitive carrier's cost, and the competitor will nevertheless find it unprofitable to enter on a small scale, because the customer is penalized on its inframarginal SBC business for giving marginal business to the competitor.⁸
17. The effects of the MVP are magnified when the underlying tariffs for the special access services purchased by a customer contain similar discounts and penalties. To illustrate, consider Southwestern Bell Telephone Company's DS1 Term Payment Plan (DS1 TPP).⁹ The base payment in the TPP is circuit-specific—it requires commitments to specific circuits for the term of the contract. But competing carriers often have a considerable amount of customer churn. For such customers, SBC offers an option (the DS1 High Capacity Service Portability Commitment) that waives the specific circuit termination penalties described above, allowing customers to add and remove circuits without penalty. Instead of circuit-specific commitments, the customer commits to a level of DS1 channel terminations. The Portability Commitment lasts for three years. The commitment level is 100% of the total DS1 channel terminations in service in the month preceding the start of the agreement. This includes DS1s under term commitments and month-to-month arrangements.

⁸ Like many exclusionary strategies, this can be defeated if entrants can realistically enter on a large scale and serve all (or a sufficient set of) customers. Thus it is exclusionary only if that is unrealistic. It is my understanding that after years of policymakers encouraging CLEC entry, CLECs still directly address only a very limited set of buildings. See *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket No. 01-338, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, 18 FCC Rcd. 16978, 17155, n.856 (2003). (“Both competitive LECs and incumbent LECs report that approximately 30,000, *i.e.*, between 3% and 5% of the nation's commercial office buildings, are served by competitor-owned fiber loops.”).

⁹ Tariff F.C.C. No. 73, Section 7.2.

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18. Each month, the total number of 2, 3, 5, and 7 year DS1 TPP Channel Terminations for the previous month will be calculated and measured against the commitment level. If this total is less than 80% of the commitment level, then the customer is billed a shortfall penalty equal to the difference between 80% of the CL and the actual number purchased times the non-recurring charge. If this total is more than 124% of the CL, then the customer is billed an adjustment factor equal to the difference between 124% of the CL and the actual number purchased times the non-recurring charge.¹⁰ The customer may increase its CL by submitting a written request, and is likely to do so given the “growth penalty” that applies if it does not promptly commit its unexpected demand growth to SBC.
19. If the customer terminates the Portability Commitment or wants to decrease the CL prior to the end of the 3-year commitment, termination liabilities apply. The termination liability is calculated as the decreased number of channel terminations multiplied by the prevailing month-to-month recurring rate multiplied by the number of months remaining in the portability commitment.
20. To supply a portion of the services a customer has placed in the MVP umbrella, a competitor may have to reduce its rates to make up for payments such as the shortfall penalty and/or termination liability specified in the DS1 TPP. These payments are in addition to the penalties in the MVP. Together, the penalties in all the tariffs for services that a customer switches to a competitor are likely to be high enough to make the customer unprofitable for the competitor to win, even when the ILEC’s overall level of prices for special access is above the competitor’s long-run cost. Again, these provisions, and others like them in the various term and volume discount plans offered by the ILECs artificially increase a customer’s cost of switching, and raise competitors’ costs of acquiring customers.
21. It is a tempting fallacy to think that optional discount plans cannot be harmful simply because consumers select them voluntarily. The claim that voluntary

¹⁰ Because only 2, 3, 5, and 7-year commitments are counted when the shortfall penalty is calculated, the portability commitment penalizes carriers who have a large portion of their DS1 in month-to-month or 1-year commitments, thus providing incentive to enter into longer contracts.

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discounts cannot harm consumers assumes that basic month-to-month rates are not affected, but in fact, once an ILEC has contracted with some of its customers for a percentage discount off the month-to-month tariff, it has an incentive to raise the latter above the level that it would have chosen otherwise.¹¹ In the longer term, exclusionary contracts can be expected to harm competition and customers, whether or not they decrease prices in the short run.

IV. Dr Taylor's Analysis Cannot Show that ILECs Lack Market Power

22. Dr William Taylor has submitted a report¹² arguing that price data show that Verizon lacks market power. The basic syllogism is that average revenue per unit measures have fallen, hence prices have fallen, hence there is no market power. Unfortunately, each step of this syllogism is fallacious. As a preliminary matter, I examine Dr. Taylor's claim that the average revenue per special access line has fallen over time. Next, I examine the first part of his syllogism, that reductions in the average revenue per line imply that prices of special access products have fallen. Finally, I analyze the second part of his syllogism, that reductions in price imply the absence of market power.

1. Flaws in the Average Revenue per Line as a Measure of Price

23. Dr. Taylor claims that "various measures of average revenue per circuit have fallen even as the demand for special access services has increased."¹³ After describing six limitations¹⁴ of his chosen price measure, the average revenue per line, he concludes: "Nevertheless, even with those caveats, the picture that emerges from the ARMIS average revenue per line data is quite clear: average revenue per line has decreased over the 1996-2004 period and decreased faster during the pricing flexibility period (2001-2004)."¹⁵ Dr. Taylor did not include sufficient information to verify his calculations.

¹¹ See Borenstein, *supra*.

¹² Declaration of William E. Taylor on Behalf of Verizon, In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, WC Docket No. 05-25. Henceforth, Taylor Declaration.

¹³ Taylor Declaration, at ¶ 9.

¹⁴ Taylor Declaration, at ¶ 15.

¹⁵ Taylor Declaration at ¶ 16.

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24. Dr. Taylor adjusted Special Access Revenue as reported in the ARMIS records to remove DSL revenues, using data he obtained from Verizon on its DSL revenues for 2002-2004.¹⁶ These DSL revenues are not part of the public record, and Dr. Taylor does not include the data he obtained from Verizon in his Declaration. In addition, he removed DSL revenues for years prior to 2000 based on the observed growth of DSL revenues in the years for which he had data. Without the underlying data, it was not possible to judge whether his calculations were correct or whether this extrapolation was reasonable.
25. Dr. Taylor relied on the number of access lines reported in ARMIS 43-08, columns *ff* and *fk*.¹⁷ The ARMIS Report instructions require carriers to calculate the number of special access lines as follows:

“The number of 64 kbps or equivalent digital special access lines terminated at the customer designated premises. ... Where DS-3 or DS-1 service is provided without individual 64 kbps circuit terminations, multiply the number of DS-3 terminations by 672 and the number of DS-1 terminations by 24 when calculating the value for this column.”¹⁸

For DS1 and DS3 lines that are provided with individual 64 Kbps circuit terminations¹⁹, the ARMIS data appear to provide a reasonable measure of capacity as represented by voice grade equivalent lines. For DS1 and DS3 lines that are provided without individual circuit termination, the ARMIS data would appear to overestimate the line count since it assumes that the entire capacity is used, whether or not it is, in fact, used. That is, a customer who needs only 12 DS0s worth of capacity, but who buys a DS1 because it is less costly than 12 DS0s, is assumed to purchase 24 DS0s if the ILEC is not asked to provide individual circuit terminations. Accordingly, the average revenue per voice-grade equivalent is artificially reduced.

¹⁶ Taylor Declaration at ¶ 18.

¹⁷ Taylor Declaration at footnote 10.

¹⁸ FCC Report 43-08.

¹⁹ A 64 Kbps line is equivalent in capacity to a voice grade circuit.

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26. I do not have the data to verify this downward bias in Dr. Taylor’s estimate of the “price”. Nor can I verify that this bias has not increased over time, contributing, at least in part, to Dr. Taylor’s finding that the average revenue per line has fallen over time. Since data communications lines often do not need individual 64 Kbps terminations, and since data communications grew more rapidly than voice communications during the period at issue, there was likely an increase in the fraction of lines for which the ARMIS reporting requirements resulted in an overcount of special access lines. If so, the ARMIS line count would grow at a faster rate than would be warranted by the actual growth in demand for capacity. The calculated average revenue per ARMIS line would then decline more quickly than the average revenue per unit of capacity actually demanded.
27. In sum, Dr. Taylor’s conclusions regarding the decline of the average revenue per line over time cannot be verified with the data available to me. There are sound reasons for believing that at least a part of the reduction may be due to ARMIS reporting conventions but this portion of the reduction cannot be quantified with the available data.
28. Much of Dr. Taylor’s analysis focuses on “various measures of the average revenue per circuit”.²⁰ Dr. Taylor asserts that this is a reasonable proxy for price: “Average revenue per voice-grade equivalent circuit is a reasonable measure of the price that customers actually pay for the special access service they receive.”²¹
29. To calculate the average revenue per voice-grade equivalent circuit, Dr. Taylor divides the total revenue obtained from the services in question by the number of special access lines obtained from ARMIS 43-08. As I have indicated earlier, the ARMIS reporting convention results in an overcount of the demand for capacity, especially for lines used for data communication.
30. The following illustrative example demonstrates my earlier point that the ARMIS measure of special access lines overstates the appropriate measure of capacity, and, as a result, contributes to underestimating the price per unit capacity actually

²⁰ Taylor Declaration, at ¶ 9.

²¹ Taylor Declaration, at footnote 7.

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- paid by customers. Suppose a DS1 is priced at \$365 per month, and a DS3 is priced at \$2,290 per month.²² These prices are assumed to remain constant in this example. Therefore, the actual change in prices in this example is zero.
31. Consider a consumer who initially purchases 6 DS1 circuits for a total charge of \$2,190. If the consumer uses all 144 voice-grade circuits in the 6 DS1s for voice traffic, the average revenue per used circuit would be $\$2,190/144 = \15.21 . Suppose the consumer's calling volume increases, and 168 voice-grade circuits are now needed to carry the new calling volume. The consumer could order another DS1 for an additional \$365, and use the additional 24 voice-grade circuits to carry the additional traffic. Alternatively, the consumer could replace the 6 DS1s with a DS3, set up 168 channel terminations on the DS3 and obtain the same quality of service that he would have obtained on 7 DS1s. The additional cost of the DS3 would be only \$100 (\$2,290 for the DS3 less \$2,190 for the 6 DS1s already in place). The DS3 would be less expensive than 7 DS1s, even though a large fraction of the DS3 was left idle.
32. If the DS3 were provided with individual circuit terminations, the ARMIS record would reflect 168 special access lines, and the average revenue per unit would be \$13.63 for a price reduction of 10.4%. Thus this ARMIS record would show a relatively modest reduction in price even though no prices had been reduced.
33. If the DS3 were provided without individual circuit terminations, the ARMIS record would reflect 672 terminations, and the average revenue per line would be \$3.41 for a much larger apparent price reduction of 77.6%.
34. But recall that the actual change in prices in this example is zero. The change in prices as measured by the average revenue per ARMIS line is -10.4% when channel terminations are provided by the BOC. The change in prices as measured by the average revenue per ARMIS line is -77.6% when channel terminations are not provided by the RBOC. In this example, the average revenue per line falls regardless of the way in which ARMIS records the number of lines demanded by

²² These are standalone monthly rates charged by SBC in California in July 2004, as reported in the Declaration of M. Joseph Stith, WC Docket No. 04-313, Attachment 1, page 13 of 20.

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- the customer, even though no prices have fallen. In general, the change in average revenue per ARMIS line will understate the change in prices paid by consumers, and in times of growing demand, overstate the reduction (if any) in the prices paid by consumers.
35. Dr. Taylor tries to correct for some of the limitations of average revenue per line by calculating separate average revenues for DS1 and DS3 lines. Shifts from DS1 to DS3 circuits do not affect the average revenue per line for each category, removing one flaw in the average revenue measure. Dr. Taylor found that: “DS-1 and DS-3 prices fell dramatically for Verizon East between 2000 and 2001; in fact, they fell at a much faster rate than would have been required by the price cap formula. Possible explanations include a national recession and the telecommunications industry meltdown.”²³
36. But DS-1 and DS-3 lines are not commodities supplied by price-takers with upward-sloping supply curves. A recession or a telecommunications meltdown may lower demand but there is no clear reason to believe it raises demand elasticity or lowers the incremental cost of supplying such lines. A more natural “composition effect” explanation of this price reduction is available. Since DS1 lines are sold at different prices (with lower prices for longer term commitments and larger volumes purchased), a shift in demand from high price contracts to low price contracts can result in a reduction in average revenue per line even though no prices were reduced. The same plausible explanation applies to DS3 lines. Thus one cannot conclude that Dr. Taylor’s partial disaggregation of all special access lines into DS1 and DS3 lines repairs the flawed average revenue measure.
37. For reasons described above, when customers upgrade from multiple DS0s to a DS1 or from multiple DS3s to OCn services, the decrease in average revenue per access line will overestimate the price reduction, if any.
38. The limitations of measures similar to the Average Revenue per Special Access Line are well known. Indeed, in his published work on the long-distance market, Dr. Taylor pointed out several flaws with a related measure of price – the Average

²³ Taylor Declaration, at ¶ 29.

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Revenue per Minute (ARPM) for long-distance calls. Dr. Taylor constructs a simple example with two products in which “ARPM declines despite the fact both of the component usage prices have increased.”²⁴ Dr. Taylor constructs other simple examples to illustrate deficiencies of average revenues as measures of price, and points out that “while AT&T’s reported ARPM has declined, competition has not brought benefits of lower prices to low-volume users.”²⁵

39. In his Declaration, Dr. Taylor states that “[t]he fact that prices fell much faster than GDPI-PI – X indicates that competitive forces have constrained LEC special access pricing, as anticipated by the Commission’s pricing flexibility decision.”²⁶ To reach this conclusion, Dr. Taylor compares changes in the Average Revenue per Line to the changes in the Price Cap Index (PCI). This is not a useful comparison. ILECs are required to compare an Average Price Index (API) to the PCI, and report this comparison to the FCC. Table 1 below, based on data submitted by Verizon BNTR to the FCC, shows that for special access lines taken as a whole, the actual change in prices is almost exactly equal to the reduction required by the price cap plan, strongly suggesting that the price cap was a binding constraint on Verizon’s special access prices, contrary to Dr Taylor’s suggestion that competition has driven prices below the level required by price cap regulation.

Table 1: API and PCI for Verizon (BNTR)				
	2002	2003	2004	2005
Total Special Access PCI	47.88	45.73	43.40	43.47
Total Special Access API	47.88	45.73	43.40	43.33
<i>Source: Verizon TRP Filings</i>				

²⁴ William E. Taylor and J. Douglas Zona. “An Analysis of the State Of Competition in Long-Distance Telephone Markets.” *Journal of Regulatory Economics* 11: 227-255 (1997). Page 238. Henceforth, Taylor and Zona.

²⁵ Taylor and Zona, page 240.

²⁶ Taylor Declaration, at ¶17.

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Moreover, rates in pricing flexibility areas have increased,²⁷ suggesting that competitive carriers have not been able to discipline the incumbents' special access prices in areas that have been deemed competitive.

2. The Relationship between Trends in Prices and Market Power

40. Dr. Taylor's Declaration largely focuses on attempting to show that prices for special access have fallen over time. He infers that Verizon does not have market power. For instance, in his Declaration he writes:

"A careful analysis of that data does not show that Verizon has been able to exercise market power. On the contrary, prices for individual DS1 and DS3 services, as well as average revenue per special access circuit have fallen steadily for special access circuits." At 6.

"Customers have benefited from additional competition and pricing flexibility as demonstrated by the continuing expansion of demand volumes accompanied by continuing falling prices." At 4.

"The NPRM entails a second analysis that entails assessing the level of and changes in the degree of competition in the marketplace, "short of conducting a burdensome market power analysis", against which the Commission warned in ¶72 of the NPRM. Unfortunately, after that warning, the NPRM (¶72-111) immediately sets out precisely the information requirements and calculations that would be necessary to undertake a market power analysis for special access services.

Fortunately, however, the evidence from recent trends in quantities and prices of special access services makes such an analysis unnecessary, as the primary price and quantity data show no signs of the exercise of market power by incumbent providers. ... Using a variety of data sources, I show that various measures of average

²⁷ Evidence supporting this point can be found in: In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, WC Docket No. 05-25. Comments of CompTel/ALTS, Global Crossing North America, Inc., and NuVox Communications. Pages 6-9.

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revenue per circuit have fallen even as the demand for special access services has increased.” At 8-9. (Emphasis added).

41. But even if Dr. Taylor were correct that a decline in average revenue is a reasonable proxy for a decline in price, price reductions do not prove lack of market power. Even a monopoly will reduce price if marginal costs fall or if demand becomes more elastic. In addition a firm with decreasing, but still very substantial, market power will reduce prices for that reason.
42. While there are pitfalls in using price-cost data to make inferences about the state of competition, it is clear that in any such endeavor it logically is the *relative levels* of price and cost, not the *rate of change* of price, that matter. Moreover, the Commission is concerned about whether prices are just and reasonable, not (only) with determining whether firms “lack market power.”
43. In his published work on competition in long distance markets, Dr. Taylor has argued that competitive prices will allow successful firms to recover their forward-looking incremental costs including an acceptable return on its investment.²⁸ He observed that the presence of high operating margins supports the conclusion that regulated competition has not produced substantial consumer benefits.²⁹ Dr. Taylor also recognizes that lower prices and increased demand can sometimes be mistakenly ascribed to competition.³⁰
44. In his Declaration in this Proceeding, Dr. Taylor himself recognizes the limitations of an analysis of trends in prices without information about costs. “Treating a small but significant nontransitory increase in price as an exercise of market power assumes the initial price is a competitive market price. Suppose 10 years of price cap regulation had constrained ILEC special access prices to lie below a competitive market level. In that case, a significant and sustained price increase when price cap regulation was removed would be welfare-increasing

²⁸ Taylor and Zona, Page 230.

²⁹ Taylor and Zona, page 229.

³⁰ Taylor and Zona, page 237.

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rather than an exercise in market power.”³¹ Elsewhere in the Declaration, Dr Taylor states: “In antitrust economics, this error – treating an increase from the current price as an exercise in market power – is called the “Cellophane fallacy”...”³² However, Dr. Taylor’s analysis does not actually compare his measure of the BOCs’ special access prices to any benchmark of cost.

45. Dr. Taylor’s comparison of the average revenue per special access line to the price reductions required under price caps provides no useful information on the relationship of prices to costs.³³ Under traditional price caps, the price cap formula of inflation (or GDP-PI) less increases in productivity in the telecommunications sector (or the X-factor) is intended to capture the expected reduction in cost that would be achieved by the regulated firm operating efficiently. As Dr. Taylor himself points out, actual price changes may vary dramatically from the average change embodied in the price cap, so that differences between prices (especially when they are misrepresented by the average revenue per line) and the price cap in the short run may not contain useful information on the state of competition, as indicated by the price-cost margin.³⁴ In any event, the cap under the CALLS plan was never intended to represent expected changes in cost, and a comparison of price changes to GDP-PI – X during the CALLS period is not helpful in determining whether prices are converging to the relevant costs.
46. Dr. Taylor also suggests that problems of allocating common costs make direct price-cost comparisons impossible. This is correct if the costs of special access are predominantly common costs as between special access and other services, but not if a large fraction of the cost is the cost of customer-specific last-mile infrastructure that the customer uses for special access. Indeed, as I have argued elsewhere,³⁵ a core principle of Telecommunications Act unbundling is that the common-cost problem becomes much less severe if one is pricing network

³¹ Taylor Declaration at 36.

³² Taylor Declaration at footnote 21.

³³ See Figure 3, and the associated discussion. Taylor Declaration, page 9.

³⁴ Taylor Declaration at 31.

³⁵ Joseph Farrell, “Creating Local Competition”, *Federal Communications Law Journal* 49:1, November 1996, 201-215.

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elements such as loops than if one is pricing services such as long-distance access. I understand that special access is essentially the full bundle of services of the loop or similar last-mile infrastructure (perhaps together with transport).

47. The BOCs have not submitted estimates of the forward-looking economic costs of special access, focusing instead on limitations of available accounting costs in the ARMIS records. However, forward-looking economic costs can be estimated using two reasonable approaches. First, UNE rates for dedicated transport are often based on forward-looking economic costs calculated using an engineering-economics cost proxy model. I understand that high capacity UNEs (DS1s and DS3s) and perhaps especially EELs are the functional equivalent of special access, so directly relevant UNE rates exist. Second, the rates charged by a competitive provider of special access services are unlikely to be systematically below its forward-looking economic cost. Thus UNE rates and CLEC special access charges may be useful benchmarks for comparing an ILEC's special access rates versus forward-looking long-run cost.
48. The record in this proceeding includes a substantial amount of information on the relationship between UNE prices and special access prices, including:

“In comparing special access vs. UNE prices, Worldcom found that DS1 UNE loops were about 18% less than comparable special access prices and DS3 UNE loops 28% less. The fixed portion of transport under UNEs was about 10% less for DS1s and the fixed DS3 transport UNE prices were actually higher than special access. On the other hand, major variances occurred on interoffice mileage (average DS1 UNE per mile charge was \$1.52 vs. \$13.72 for special access, and for DS3s it was \$23.35 vs. \$57.84).”³⁶

“In Atlanta, the mileage component of a 10-mile (UNE) EEL was \$1.80, whereas BellSouth charged \$180 in mileage in MTM special access prices or \$80 under their discount plan. Similar disparities are found in

³⁶ Henry G. Hultquist, Worldcom, Letter to Marlene H. Dortch, 10/29/02, FCC, Docket CC 96-98, 98-147, 01-338 (p. 7).

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Sothwestern Bell and Ameritech (pp 21-22, 33-34). Additionally, mileage costs were twice as high in price flex MSAs (\$8/mile) than under price caps (\$3.90/mile).”³⁷

49. A study by Mr. Joseph Stith of AT&T compares (a) special access rates in price cap areas to the corresponding rates in areas where the BOCs have been granted pricing flexibility, (b) price cap rates to the corresponding UNE rates, and (c) price flexibility rates to UNE rates. He finds that “for a 10-mile circuit the Bells’ tariffed rates are, on average, significantly above their rates for equivalent UNEs.”³⁸ Mr. Stith finds similar results for zero-mile circuits.
50. In its Comments in this Proceeding, BellSouth submitted a study by RHK showing that ILEC prices substantially exceed either comparable UNE rates or competitors’ rates.³⁹ The study reports that BellSouth’s average special access prices are \$240, \$1,356 and \$5,077 for DS1, DS3 and OCN circuits. The average prices for BellSouth’s UNE transport element for DS1 and DS3 circuits are reported to be \$141 and \$623, or about half the corresponding special access prices. The average prices charged by competitive carriers for DS1, DS3 and OCN circuits are reported to be \$140, \$700, and \$3,300, respectively, or about half the corresponding Bell special access prices. Since UNE prices are based on estimated forward-looking costs and since competitive carriers presumably seek at least to cover their forward-looking costs, the RHK study is consistent with the conclusion that BellSouth’s special access prices considerably exceed forward-looking costs.
51. The RHK study purports to show that BellSouth has a small revenue share for many categories of special access services, yet it reports that BellSouth’s prices for these services are significantly higher than the prices charged by competing carriers, and also considerably higher than UNE rates. The study does not explain why, in an apples-to-apples comparison, BellSouth is able to charge a substantial

³⁷ NuVox, Initial Comments, 10/4/04, WC 04-313, p. 22.

³⁸ Declaration of M. Joseph Stith, WC Docket No. 04-313, September 30, 2004. At 17.

³⁹ Declaration of Stephanie Boyles, June 8, 2005. WC Docket No. 05-25.

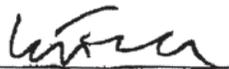
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premium over its competitors, and maintain prices in excess of UNE rates based on forward-looking costs.

52. The evidence thus suggests that special access rates are often significantly above corresponding UNE rates. The UNE rates are based on forward-looking cost, incorporating (unlike competitive carriers' pricing) ILEC-level economies of density. ILECs' special access rates are also considerably higher than the rates charged by competitive carriers.

Certification

I hereby certify, under penalty of perjury, that the statements and information contained in my declaration are correct and true to the best of my knowledge.



Joseph Farrell
29 July, 2005

Attachment 2

Ofcom Final Statement Summary

Summarizing the Ofcom Business Connectivity Market Review;
Review of retail leased lines, wholesale symmetric broadband
origination and wholesale trunk segments (March 28, 2013)

Business connectivity market review - final statement

Published 28|03|13

Summary

Introduction

1.1 This Statement sets out decisions designed to address concerns we have identified about the extent of competition in the provision of leased lines in the UK.

1.2 Leased lines provide dedicated symmetric transmission capacity between fixed locations, and their overall value exceeds £2bn per annum in the UK. They play an important role in business communications services and are used to support a wide variety of applications, both in the private and public sectors. They also play a significant role in delivering fixed and mobile broadband services to consumers, because communications providers (CPs) use them extensively in their networks.

1.3 BT remains by far the largest wholesale supplier of leased lines in the UK. For illustrative purposes, if we consider all wholesale circuits, we estimate that BT has a share of 82% of volumes. The majority of CPs remain reliant on BT's network in providing services to their customers.

1.4 Our decisions are designed to promote competition in the provision of leased lines and the services which use them, and will affect the availability, choice, price, quality and value for money of data-transfer services throughout the UK. They are therefore important in furthering the interests of citizens and consumers.

Key trends in the market

1.5 The demand for leased lines bandwidth has increased steadily in the last few years, driven by sustained increases in both the penetration and the speed of business and consumer data services. Adoption of remotely hosted computing applications (often known as 'cloud computing'), growing consumption of video content, and the rapid growth of e-commerce and of internet applications have all added to businesses' bandwidth demands. At the same time, providers of consumer broadband services, both fixed and mobile, have required steadily increasing bandwidth to support the growth in traffic from their end-users.

1.6 Looking forward, the growth in demand for leased lines capacity seems set to continue as businesses demand more bandwidth, and as providers of mass market broadband services invest in fixed super-fast services and mobile next-generation (4G) services.

1.7 Modern technologies are driving down the unit costs of leased lines bandwidth. The number of services which use legacy time-division multiplex (TDM) technologies has been declining, although they still account for most installed leased lines. Modern Ethernet transmission equipment is now preferred in most new installations because it costs less and supports higher bandwidths.

1.8 The trend to lower unit costs is particularly evident in the increasing adoption of wavelength-division multiplex (WDM) technology. This technology can multiply by several times the bandwidth transmissible in an optical fibre. WDM equipment allows CPs to aggregate traffic from different services and to use optical fibres efficiently in the core of their networks as demand for bandwidth continues to increase. CPs are also deploying WDM equipment increasingly at their customers' premises if very high bandwidths are required.

The market review process

1.9 We review competition in some communications markets periodically, in accordance with the EU regulatory framework which is implemented in the UK by the Communications Act 2003 as amended (the Act). Our review process involves three analytical stages. First, we define each relevant market in terms of its products and geographic scope. Then we assess whether any CP has a position of significant market power (SMP) in any of the relevant markets, which means an undertaking enjoying a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers. As part of our SMP assessment we consider how competitive conditions may change over a forward-look period, which, in this review, we have taken as three years. Finally, we assess which regulatory remedies we should impose to address competition concerns that arise from any SMP we find.

1.10 We last reviewed these markets in 2007/8 (the 2007/8 Review), and set out our findings in statements published in December 2008 and February 2009.

Consultations and sources of information

1.11 Before starting our substantive analysis in this review, we published a Call for Inputs (CFI) in April 2011 to gather stakeholders' views on the key aspects of the review such as market definition, SMP assessment and remedies.

1.12 We then conducted market research, held extensive discussions with industry stakeholders and user groups, and analysed data which CPs provided in response to our formal requests for information. We have also reviewed relevant publicly-available information.

1.13 We set out the provisional conclusions of our market review in two consultations in summer 2012. The first, published in June 2012 (the June BCMR Consultation) set out our provisional findings and proposals to address the concerns we have identified about the extent of competition in the provision of leased lines in the UK. The second published in July 2012 (the LLCC Consultation) covered our proposals to apply charge controls to certain services provided by BT in these markets.

1.14 After reviewing the responses to the June BCMR Consultation and further discussions with industry stakeholders, we issued a further consultation in November 2012 (the November BCMR Consultation) in which we proposed some changes to our proposals. This Statement incorporates our consideration of responses to the June BCMR Consultation, the LLCC Consultation and the November BCMR Consultation.

1.15 On 21 February 2013, we notified our draft Statement containing our provisional conclusions on market definitions, market power determinations and remedies for EU consultation to the European Commission (Commission), BEREC and national regulatory authorities of other Member States. In its decision letter of 21 March 2013, the Commission made two comments on the draft Statement, but it did not raise any concerns about our measures.

Summary of our decisions

Retail product market definitions

1.16 We have defined a new product market for very high bandwidth services, and refer to it as 'Multiple Interface' or 'MI' leased lines. This market includes services with bandwidths greater than 1Gbit/s and services of any bandwidth delivered with WDM equipment at customers' premises. In the 2007/8 Review, we did not define a market for such services. Since then, the cost premium associated with WDM equipment has eroded and many major CPs now use WDM to provide high-bandwidth services.

1.17 In other respects, our retail product market definitions are similar to those identified in the 2007/8 Review. We recognise the growing capabilities of current generation asymmetric broadband services and the advent of super-fast broadband, but do not consider, based on our analysis, that leased lines and broadband services are in the same economic market. We also continue to distinguish between services presented to the end-user with traditional interface (TI) technologies, either TDM or analogue, and those with alternative interfaces (AI), mainly Ethernet. While there is migration from TI to AI products, the evidence on relative pricing and patterns of demand suggests that they are not sufficiently close substitutes for us to consider them as parts of the same economic markets. Similar distinctions lead us to define separate markets for TI products at different bandwidths. We summarise below the product markets we believe can be identified at the retail level generally.

Retail leased lines product market definition

Service interface	Retail product markets and bandwidth breaks				
Traditional (TI)	TI very low bandwidth: below 2Mbit/s	TI: from 2Mbit/s up to and including 8Mbit/s	TI medium bandwidth: Above 8Mbit/s up to and including 45Mbit/s	TI high bandwidth: Above 45Mbit/s up to and including 155Mbit/s	TI very high bandwidth: 622Mbit/s
Alternative (AI)	AI low bandwidth - Up to and including 1Gbit/s				
Multiple (MI)	MI – services with bandwidth greater than 1Gbit/s, and services of any bandwidth delivered with WDM equipment at customers' premises.				

1.18 In the June BCMR Consultation we defined a retail market for low bandwidth TI services at bandwidths up to 8Mbit/s. After further analysis, we have revised our definition as shown above and

now define a retail market for very low bandwidth TI services at bandwidths below 2Mbit/s and a retail market for TI services at bandwidths from 2Mbit/s up to and including 8Mbit/s.

1.19 In light of our analysis of the geographic scope and of the corresponding wholesale markets (see below), we have identified the retail market for TI very low bandwidth leased lines in the UK (excluding the Hull area) as susceptible to SMP regulation. We did not identify any other retail markets outside the Hull area as susceptible to SMP regulation, because we consider that addressing any competition concerns in the wholesale markets which we have identified for AI, MI and higher-bandwidth TI leased lines will address any concerns in the corresponding retail markets.

1.20 In the Hull area, we have identified two separate retail markets as susceptible to SMP regulation: one for TI low-bandwidth leased lines (up to and including 8Mbit/s) and the other for AI low-bandwidth leased lines. We consider that addressing any competition concerns in the wholesale markets for higher-bandwidth TI leased lines in the Hull area will address any concerns in the corresponding retail markets. No MI leased lines services are currently supplied in the Hull area.

Wholesale market definitions

1.21 In many respects our wholesale market definitions reflect those of the retail market. Our analysis also indicates that:

- combined markets exist for wholesale access and backhaul products, particularly because, in general, CPs are likely to continue to purchase access and backhaul together. These markets are referred to as TI Symmetric Broadband Origination (TISBO), AI Symmetric Broadband Origination (AISBO) and MI Symmetric Broadband Origination (MISBO);
- wholesale services used to provide backhaul for Local Loop Unbundling (LLU) and Radio Base Station (RBS) services still fall within the markets for wholesale symmetric broadband origination; and
- the bandwidth breaks we define for TI and AI retail services are mostly applicable to the wholesale markets.

1.22 The main differences between our analysis now and that of the 2007/8 Review are:

- There are separate markets for regional and national TI trunk connectivity. In our previous review of the market we defined a single TI trunk market. We now consider that the characteristics of the regional trunk market are very similar to those of symmetric broadband origination, and are significantly different from those of national trunk routes.
- Consistent with our view in relation to the retail market, we are defining a wholesale MI market which includes any service faster than 1Gbit/s and any service delivered with WDM equipment at the customers' premises, irrespective of bandwidth and interface.

Wholesale product market definition

	Product markets			
Traditional Interface Symmetric Broadband Origination (TISBO)	Low bandwidth TISBO: ≤ 8Mbit/s	Medium bandwidth TISBO: >8Mbit/s, ≤45Mbit/s	High bandwidth TISBO: >45Mbit/s, ≤155Mbit/s	Very high bandwidth TISBO: 622Mbit/s
Alternative Interface Symmetric Broadband Origination (AISBO)	Low bandwidth AISBO: ≤1Gbit/s			
Multiple Interface Symmetric Broadband Origination (MISBO)	MISBO: >1Gbit/s irrespective of interface, and services of any bandwidth delivered with WDM equipment at customers' premises			
Trunk / core connectivity	TI regional trunk at all bandwidths			
	TI national trunk at all bandwidths			
	National core conveyance at all bandwidths			

1.23 We have determined that separate geographic markets exist (i) in the Hull area for all wholesale leased lines, and (ii) in a defined area of London and including Slough (the Western, Eastern and Central London Area, or WECLA) for all the defined wholesale symmetric broadband origination product markets other than the low bandwidth (up to and including 8Mbit/s) and very high bandwidth (622Mbit/s) TISBO markets. We summarise below the wholesale markets we have defined (both product and geographic), each of which is susceptible to SMP regulation.

Wholesale symmetric broadband origination market definitions

Product market		Geographic markets		
TISBO	Low bandwidth ≤ 8Mbit/s	The UK excluding the Hull area		The Hull area
	Medium Bandwidth >8Mbit/s, ≤45Mbit/s	The UK excluding the WECLA and the Hull area	The WECLA	The Hull area
	High bandwidth >45Mbit/s, ≤155Mbit/s	The UK excluding the WECLA and the Hull area	The WECLA	The Hull area
	Very high bandwidth 622Mbit/s	The UK excluding the Hull area		The Hull area
AISBO	Low bandwidth ≤1Gbit/s	The UK excluding the WECLA and the Hull area	The WECLA	The Hull area
MISBO	>1Gbit/s, and any services with WDM equipment at customers' premises	The UK excluding the WECLA and the Hull area	The WECLA	The Hull area

1.24 Our analysis has not found separate geographic markets in any other parts of the UK for any wholesale services.

Market power assessment

Overview of SMP findings

1.25 We summarise below our market power determination for each relevant market or, as the case may be, our finding that the market in question is effectively competitive.

Overview of SMP findings

Interface technology	Bandwidth (Mbit/s)	Retail Services		Wholesale Segments			
		UK	Hull	Symmetric Broadband Origination			Trunk
		UK	Hull	The WECLA	UK except the WECLA and Hull	Hull	UK
Traditional (TI)	V Low: <2	BT	KCOM	BT			National No SMP
	Low: <=8			No SMP	BT	KCOM	
	Med: >8, <=45			No SMP	BT	KCOM	Regional BT
	High: >45, <=155			No SMP			
	Very High: 622			No SMP			
Alternative (AI)	Low <=1,000		KCOM	BT	BT	KCOM	
Multiple (MI)	>1,000, and any if WDM at customer's premises			No SMP	BT		

Retail markets outside the Hull area

1.26 We have found that BT has SMP in the retail very low bandwidth TI market outside the Hull area for services at bandwidths below 2Mbit/s. BT continues to have a very high share (84%) of the supply of these services. In the light of this and the existence of barriers to entry and expansion, and taking into account that CPs are less likely to invest in this market since demand is declining, we found that BT has SMP in this market.

1.27 We consider that since the 2007/8 Review upstream wholesale remedies have stimulated competition for provision of 2Mbit/s retail digital services and consequently we have withdrawn ex ante regulation of these services.

Wholesale markets outside the Hull area

1.28 We have found little, if any, change in competitive conditions in wholesale TISBO markets, whose volumes, although significant, are declining rapidly. Having defined separate regional and national markets for TI trunk services, we found that BT does not have SMP in the national trunk market. We summarise below the markets we have identified at the wholesale level outside Hull and whether or not we have found SMP in them.

SMP findings for the TI wholesale markets in the UK excluding the Hull area

Product market	Geographic scope	SMP designation now	SMP designation in 2007/8 Review
Low bandwidth TISBO (<=8Mbit/s)	UK excluding the Hull area	BT	BT
Medium bandwidth TISBO (>8Mbit/s, <=45Mbit/s)	UK excluding the Hull area & the WECLA	BT	BT*
	The WECLA	No SMP	No SMP*
High bandwidth TISBO (>45Mbit/s, <=155Mbit/s)	UK excluding the Hull area & the WECLA	BT	BT*
	The WECLA	No SMP	No SMP*
Very high bandwidth TISBO 622Mbit/s)	UK excluding the Hull area	No SMP	No SMP
Wholesale national TI trunk segments	UK excluding the Hull area	No SMP	BT**
Wholesale regional TI trunk segments	UK excluding the Hull area	BT	

* These relate to the market power designations in 2008 for UK excluding the Central and East London Area (CELA) and Hull, and for CELA.

**Ofcom defined a single trunk market in 2008 and found BT to have SMP.

1.29 In the case of wholesale AI terminating segments (AISBO services) at bandwidths at or below 1Gbit/s, similar to our last market review, we found that BT has SMP in the UK excluding the Hull area and the WECLA. We consider that outside the WECLA and the Hull area, despite growing CP investment, BT's 74% share by volume has changed little since the 2007/8 Review. We believe that these circumstances are not likely to change over the forward-look period of this review. The costs of digging trenches and building duct network are unlikely to reduce significantly, and the ubiquity of BT's network means that other CPs will continue to incur higher average costs than BT to serve new customers.

1.30 In the WECLA, our analysis shows that there has been more infrastructure investment than in the rest of the UK. However, despite extensive alternative network infrastructure and despite strong growth

in demand, BT has maintained its competitive position since the last market review with a volume share that we estimate to be in the range 45%-55%. Taking into account this estimate as well as other relevant criteria in assessing the economic characteristics of the market, while we have concluded that BT has SMP in the WECLA, we believe that the prospects for competition are more favourable there than elsewhere in the UK.

1.31 We have also concluded that BT has SMP in the wholesale MI (MISBO) market in the UK excluding the Hull area and the WECLA. Demand for services faster than 1Gbit/s has been growing very fast since the last review. We believe that circuit volumes have increased more than threefold since 2006/07, and we expect that this rate of growth will continue throughout the coming review period. We estimate that BT's share of volumes is 57%, and we are confident that it exceeds 50%. The market appears to be highly concentrated, with BT supplying more than six times the volumes of the second largest provider. Whilst the high growth and high average revenue per customer suggest that the prospects for competitive entry in this market may be favourable, BT derives a strong advantage from the ubiquity of its network.

Retail markets in the Hull area

1.32 We have found that KCOM has SMP in the retail TI low bandwidth (≤ 8 Mbit/s) market and the retail AI low bandwidth (≤ 1 Gbit/s) market in the Hull area. In the 2007/8 Review we found that no operator had SMP in either of these markets.

1.33 We now believe that our finding in the 2007/8 Review that KCOM did not have SMP in the retail TI low bandwidth market was based on incomplete submissions from KCOM, which resulted in a significant understatement of its shares of the retail (and wholesale) markets. Our estimate of KCOM's share of the retail low bandwidth TI market of 78% is very similar to our estimate for the 2003/04 Review. Therefore, we now believe that KCOM's share is both high and relatively stable over time.

1.34 The retail TI low bandwidth (≤ 8 Mbit/s) market in Hull is small and declining. We therefore consider that there is little prospect of increased competition during this review period. Overall, we consider that even though a regulated wholesale input is available, KCOM is unlikely to be effectively constrained by competitors in the retail market, and therefore has SMP.

1.35 In the retail AI low bandwidth (≤ 1 Gbit/s) market in Hull we consider, in particular, that KCOM has a very high share and that, even though the market is growing, it does not offer sufficient potential for growth to attract significant new competitive entry.

Wholesale markets in the Hull area

1.36 We have concluded that KCOM has SMP in all wholesale markets in the Hull area with the exception of MISBO, in which no services are currently supplied. Our findings are consistent with the conclusions of the 2007/8 Review.

1.37 We have concluded that KCOM has SMP because there is almost no alternative fixed network infrastructure in the Hull area, and KCOM's share in each of the markets is at, or very close to, 100%. Although there has been very recent entry into the market by MS3 Communications, which is building a

network in the Hull area, we consider it unlikely that this will represent a sufficient constraint at the majority of business premises in Hull to constrain KCOM's behaviour over the course of the three year review period.

SMP findings for wholesale markets in Hull

Product market	SMP designation	SMP designation in 2007/8 Review
Low bandwidth TISBO (<=8Mbit/s)	KCOM	KCOM
Medium bandwidth TISBO (>8Mbit/s, <=45Mbit/s)	KCOM	KCOM
High bandwidth TISBO (>45Mbit/s, <=155Mbit/s)	KCOM	KCOM
Very high bandwidth TISBO (622Mbit/s)	KCOM	No SMP
Low bandwidth AISBO (<=1Gbit/s)	KCOM	KCOM
MISBO (>1Gbit/s)	No SMP	No SMP**

*** MISBO had not been defined in 2008. However, there was no SMP in relation to circuits above 1Gbit/s throughout the UK.*

SMP remedies

Overall approach

1.38 Our overall approach to remedies in leased lines markets is aimed primarily at promoting competition in the long term at the wholesale level based on investment in economically efficient alternative infrastructure, and supplemented by seeking to ensure that CPs can compete effectively elsewhere in downstream markets by using regulated access to BT's, and KCOM's (in the Hull area), wholesale services. This approach is designed to ensure that CPs can compete effectively in providing services downstream of the relevant wholesale leased lines market anywhere in the UK. However, we consider that some regulation to ensure the provision of retail leased lines remains necessary as part of our overall approach.

1.39 CPs often rely heavily on BT's regulated wholesale leased lines services throughout the UK except the Hull area, and on those of KCOM in the Hull area. Having considered appropriate SMP remedies in this review, we have imposed regulations designed to ensure, amongst other things, that BT and KCOM continue to provide such services.

Passive remedies

1.40 We have also considered the case for imposing an alternative or additional set of requirements known as passive remedies, such as requiring BT to provide access to its ducts, poles or dark fibre. We have decided not to impose such passive remedies.

1.41 We recognise that it is possible that the imposition of passive remedies in leased lines could support competition in downstream markets. However, imposition of passive remedies is likely to be inconsistent with important aspects of the package of remedies which we are imposing, including the form of the charge controls. We therefore needed to decide which of the two alternative approaches is likely to be more consistent with securing or furthering our statutory duties.

1.42 We have considered the potential benefits that imposition of passive remedies could deliver. Some CPs have argued, for example, that the pace of innovation could be increased in some parts of the market. However, it is not clear to us that the competition issues we have identified in leased lines would be addressed more effectively in the round by the imposition of passive remedies than by our current approach to remedies. Our analysis suggests that the specific benefits put forward by stakeholders of imposing passive remedies could, to a large extent, be achieved by imposing alternative remedies such as price controls on BT's provision of wholesale leased lines services. At the same time, we consider there are significant risks that the imposition of passive remedies could lead to worse outcomes for consumers and for competition.

1.43 Facilitating the transition from the current regulatory regime to one where competition based on passive remedies is sustainable and effective would require a significant degree of regulatory support and intervention and, potentially, changes to the definition of the regulatory boundaries and role of Openreach.

1.44 At present we have seen no evidence that any CPs would invest substantially in infrastructure based on passive remedies if we were to impose them in leased lines markets. Furthermore, we have seen no evidence that imposing passive remedies in leased lines markets would, as some stakeholders have claimed, unlock significant new investments in fixed next-generation access (NGA) infrastructure for consumer superfast broadband services.

1.45 In conclusion, while imposition of passive remedies is likely to require significant regulatory changes and intervention, and we would therefore need clear evidence to persuade us that this would be justified, it is not clear at present that imposing passive remedies would lead to better market outcomes in the round than the package of remedies we have decided to impose. We have therefore decided not to impose passive remedies.

Retail very low bandwidth TI services outside the Hull area

1.46 In relation to retail markets, we have had regard to the fact that these are not included in the list of markets in the EC's Recommendation in which, at the European level, ex ante regulation is likely to be required. We have therefore applied the so-called 'three criteria test' to assess whether such regulation is appropriate to national circumstances in the UK, and consider that the three criteria are cumulatively satisfied in relation to the retail market for services at bandwidths below 2Mbit/s (very low bandwidth TI services) in the UK (outside the Hull area).

1.47 In light of our revised market definition, retail services at 2Mbit/s or above fall outside the market. Consequently we are removing all ex ante obligations on BT concerning the provision of these retail services.

1.48 BT intends to withdraw services at bandwidths below 2Mbit/s, including some analogue services (i.e. those within the revised market definition) by no later than March 2018. In the interim, we are concerned to ensure that CPs and end users will have certainty of continuing supply, appropriate notice of retirement dates of services, protection from potentially excessive pricing and protection from the risk that groups of customers will be subject to undue discrimination.

1.49 The table below summarises the remedies we have decided to impose on BT in order to address these concerns.

Overview of SMP remedies in the retail very low bandwidth TI market

Product type	Remedies
Analogue circuits	<ul style="list-style-type: none"> • Obligation to supply existing services, with at least a year's notice of withdrawal • Obligation not to discriminate unduly • Requirement to publish a reference offer, including prices, terms and conditions • Cost accounting obligations • Safeguard cap on retail prices
Sub 2Mbit/s digital circuits	<ul style="list-style-type: none"> • Obligation to supply existing services, with at least a year's notice of withdrawal • Obligation not to discriminate unduly • Requirement to publish a reference offer, including prices, terms and conditions • Cost accounting obligations
2Mbit/s and 8Mbit/s digital circuits	None - Under our revised market definition these services fall outside the scope of the market and we are therefore removing all ex-ante regulation

Wholesale TI markets in which we have found that BT has SMP

1.50 As with retail markets, we have noted that TI regional trunk segments are not included in the list of markets in the EC's Recommendation in which, at the European level, ex ante regulation is likely to be required. We have therefore applied the three criteria test to assess whether such regulation is appropriate to national circumstances in the UK, and consider that the three criteria are cumulatively satisfied in relation to this market.

1.51 We have found that BT has SMP in the wholesale markets for low bandwidth TISBO in the UK excluding the Hull area and for TI regional trunk segments of leased lines in the UK. We have also found that BT has SMP in the medium and high bandwidth TISBO markets in the UK excluding the Hull area and the WECLA. The state of competition in these markets broadly mirrors that of our previous market review. We have therefore decided to maintain the same set of SMP regulations that are in place today including the existing PPC and RBS Backhaul directions.

Overview of SMP remedies imposed on BT in the wholesale TI markets

- Requirement to provide network access on reasonable request including an obligation to offer fair and reasonable charges, terms and conditions
- Requirement not to discriminate unduly
- Requirement to publish a reference offer
- Requirement to notify changes to prices, terms and conditions (28 days notice for new services and price reductions, 90 days for all other notifications)
- Requirement to publish quality of service information as required by Ofcom
- Requirement to notify changes to technical information with 90 days notice
- Accounting separation and cost accounting obligations
- Requirements relating to requests for new network access
- Charge control
- A direction under the network access obligation requiring BT to provide Partial Private Circuits
- A direction under the network access obligation requiring BT to provide RBS Backhaul
- Requirements to provide accommodation in BT exchanges and to provide specific types of interconnection service:
 - Customer Sited Handover
 - In Span Handover
 - In Span Handover extension
 - In Building Handover

Wholesale AISBO markets in which we have found that BT has SMP

1.52 We have decided to impose new controls on BT's charges for wholesale AISBO services. A separate control will apply in each of the two geographic markets - one within the WECLA and the other outside it (except the Hull area) - which we identified for these products. The charges subject to the controls will include those for wholesale AISBO products and for ancillary services reasonably required, such as interconnection, accommodation and excess construction.

1.53 Our charge controls take into account that the prospects that competition in the provision of wholesale AISBO services will become effective beyond the forward-look period of this review are more favourable in the WECLA than elsewhere in the UK.

1.54 In all other respects, the remedies for the two geographic markets which we have identified outside Hull are identical. They are summarised in the table below. Overview of remedies for wholesale AISBO services (both within the WECLA and elsewhere in the UK except the Hull area)

1.55 Since we concluded the 2007/8 Review there have at times been differences in view between BT and CPs as to how BT should comply with its obligations in the market for wholesale low bandwidth AISBO. In imposing remedies in this review we have therefore sought to achieve greater certainty. In particular, we have:

- required BT to provide network access on the basis of equivalence of inputs (EOI) excluding any network access which BT is not providing on an EOI basis at 31 March 2013. We have concluded that the EOI requirements should extend to BT's allocation of accommodation and power to CPs in its exchanges, but not to other aspects of provision of accommodation services or to interconnection services;

- specified explicitly that BT's wholesale Ethernet products must include separate access and backhaul services; and
- clarified the definitions of trunk segments and terminating segments in the AI markets.

1.56 We have also clarified that Openreach should process requests to develop products in accordance with the SMP condition which regulates new network access, and not in accordance with its own commercial process.

The wholesale MI market in which we have found that BT has SMP

1.57 We have not regulated this market under the EC Framework until now, although BT has, in Undertakings it agreed with us under the Enterprise Act, committed to provide wholesale services in this market on the basis of equivalence of inputs (EOI). We summarise in the table below the remedies we have decided to impose in this market.

Remedies imposed on BT for the wholesale MI services outside the WECLA

<ul style="list-style-type: none"> • Requirement to provide network access on reasonable request, including an obligation to fair and reasonable charges, terms and conditions and also including (without prejudice to the generality of the network access requirement) <ul style="list-style-type: none"> o disaggregated Ethernet access and backhaul; o end-to-end Ethernet products • Requirement not to discriminate unduly • In addition, a requirement to provide network access on the basis of Equivalence of Inputs (except for certain specified exceptions including accommodation services) • Requirements relating to requests for new network access • Requirement to publish a reference offer • Requirement to notify changes to charges and to terms and conditions (28 days notice for new services and price reductions, 90 days for all other notifications) • Requirement to notify technical information • Requirement to publish quality of service as required by Ofcom • Accounting separation and cost accounting obligations • Charge controls – separate controls to apply within and outside the WECLA • Requirement to provide accommodation in BT exchanges and to provide specific types of interconnection service: <ul style="list-style-type: none"> o Customer-sited handover o In-building handover • A direction under the network access obligation relating to service-level guarantees
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1.58 We recognise that CPs which invest in physical infrastructure compete with BT in this wholesale market, and that such competition could be sustainable, both because demand is growing and because the value of MI services is relatively high. We want to maintain their incentives to do so and yet protect consumers from the risk of excessive prices.

1.59 While most MI services are delivered by installing WDM equipment at customers' premises, WDM technology is still evolving rapidly, and we have not imposed price controls on BT's WDM-based

wholesale products in this market. However, we have imposed a charge control on BT's wholesale single-service Ethernet products. We consider that imposing such a control is likely to maintain CPs' incentives to invest in physical infrastructure, while applying appropriate constraints on BT's ability to charge high prices.

1.60 At the same time, we want to promote greater competition by supporting development of solutions that could enable CPs to deliver WDM-based services by interconnecting their own core networks with BT's ubiquitous access to end-users' premises. Until recently, BT's WDM-based wholesale MI products only supported connectivity entirely over BT's physical infrastructure from end to end, and could not support interconnection effectively. BT has recently launched product variants which may support such interconnection, but it is too early to tell if those product variants will enable effective interconnection solutions.

1.61 Currently, BT has no need to consume the variants which could support interconnection. We consider that this gives BT the ability to discriminate between its competitors and its own downstream divisions in providing those variants. Noting that those variants are very similar to BT's other WDM-based wholesale MI products, we have concluded that:

- a) in relation to matters other than price, BT should provide the interconnection variants of its WDM-based wholesale MI products on the basis of EOI with its other WDM-based wholesale MI products; and
- b) BT should not discriminate unduly between the prices it charges for the variants of its products, which means that the difference in price between variants of the same product which do and do not support interconnection, and are of the same radial distance, should be no greater than the difference between their long-run incremental costs.

1.62 We are also imposing a set of obligations on BT in relation to accommodation and other interconnection services which would support the remedies we have imposed for this market.

Retail markets in the Hull area in which we have found that KCOM has SMP

1.63 As noted above, the retail markets for TI low-bandwidth and AI low-bandwidth leased lines are not included in the list of markets in the EC's Recommendation in which, at the European level, ex ante regulation is likely to be required. We have therefore applied the three criteria test to assess whether such regulation is appropriate to national circumstances in the UK, and consider that the three criteria are cumulatively satisfied in relation to these markets.

1.64 As there is very little competition in the retail low bandwidth TI and AI markets in the Hull area, our aim is to ensure that consumers have certainty of supply, are protected from exploitation through high prices and that there is no undue discrimination between different classes of customer. In imposing remedies on KCOM we have sought to achieve this aim while taking into account the relatively small scale of the market in the Hull area. We summarise them in the table below.

Remedies imposed on KCOM for retail low bandwidth TI services and AI services in the Hull area

- Requirement to supply retail leased lines
- Obligation not to discriminate unduly
- Requirement to publish a reference offer

1.65 Whilst we are not imposing a control on KCOM's retail charges, we would expect those charges to align with a reasonable benchmark of competitive charges. We consider that a suitable candidate for such a benchmark would be KCOM's wholesale charges with a reasonable allowance for gross retail margin. We have also decided to require KCOM to publish maximum prices to facilitate monitoring.

1.66 We have decided that KCOM should be allowed to offer bespoke pricing as long as prices are not unduly discriminatory and do not exceed the prices set out in its published reference offer.

Wholesale markets in the Hull area in which we have found that KCOM has SMP

1.67 During the forward-look period of this market review we foresee limited scope for competitive entry even in the fast growing AISBO market. However, to the extent that CPs require wholesale services in Hull to fulfil the requirements of customers outside Hull who may require connectivity in Hull (e.g. for branch offices), we consider it important that CPs are assured of access to wholesale services on non-discriminatory terms and of protection from excessive pricing. We have imposed substantially the same SMP obligations on KCOM as we did in the previous market review.

Remedies imposed on KCOM in wholesale TI and wholesale AI services in the Hull area

- Requirement to provide network access on reasonable request
- Obligation not to discriminate unduly
- Requirement to publish a reference offer
- Requirement to notify charges, terms and conditions
- Requirement to notify technical information
- Accounting separation obligation

1.68 Whilst we have not proposed to control KCOM's wholesale charges, we would expect those charges to align with a reasonable benchmark of competitive charges. KCOM has offered voluntary undertakings in relation to its wholesale prices, which we publish at Annex 11 to this Statement. We welcome these undertakings, which we think will provide stakeholders with valuable reassurance about leased line charges in Hull over the next three years.

1.69 We require KCOM to publish maximum prices to facilitate monitoring. We have also decided that KCOM will be allowed to offer bespoke pricing as long as prices are not unduly discriminatory and do not exceed the prices set out in its published reference offer.

Charge controls for BT's services

1.70 The previous charge controls expired on 30 September 2012. From 1 October 2012 BT has set charges in accordance with its voluntary commitments. These voluntary commitments expire on 31 March 2013.

1.71 The charge controls set out in this Statement will commence on 1 April 2013 and last for three years. We considered that the duration of the charge controls should be consistent with the forward-look period used in our analysis.

Our approach to charge controls

1.72 In developing and designing our charge control we have had regard to a number of objectives , including:

- To ensure that the prices for wholesale leased lines services are not excessive and are broadly in line with the cost of provision. Wholesale prices for leased lines are likely to be reflected in retail prices. Excessive wholesale prices are likely to result in excessive retail prices, which would be to the detriment of consumers.
- We are seeking to promote efficiency and sustainable competition in the provision of wholesale leased lines services, as well as conferring the greatest possible benefit to end-users; in doing so we have also taken into account the extent of BT's investments. Through the structure of the charge control, it is possible to provide BT with the opportunity to make efficiency improvements. These improvements would also be in the interest of consumers, as they can ultimately share the benefits of greater efficiency.

1.73 We are introducing an RPI -X type control for the main basket controls. This type of control aims to align prices with cost at the end of the charge control period (i.e. 2015/16). This approach has been widely used in the regulation of UK utilities, including those in the telecommunications sector. However, for AISBO services $\leq 1\text{Gbit/s}$ in the WECLA, where the prospects that competition will become effective beyond the forward-look period of this review are more favourable than elsewhere in the UK, we follow a more deregulatory approach, with a 'safeguard cap'.

1.74 As with the previous leased lines charge controls, we will charge control TI services and Ethernet services in separate baskets. However, in contrast to the previous controls, we have incorporated some of the additional ancillary services in the main baskets, e.g., associated ancillary services and equipment. We apply a number of sub-caps on certain services, together with sub-baskets, where the overall basket cap may not offer sufficient protection to customers.

1.75 Overall, we consider that the charge controls are appropriate to secure or further our statutory duties, including ensuring that we further the interests of citizens and consumers in the relevant leased lines markets.

Summary of our conclusions for charge controls

1.76 We are implementing two separate service baskets for wholesale services:

- i) TI - covering low, medium and high bandwidth services outside the WECLA, low bandwidth services within the WECLA and regional trunk services at all bandwidths.
- ii) Ethernet - covering services up to and including 1Gbit/s outside the WECLA and Ethernet services above 1Gbit/s outside the WECLA.

1.77 In addition, we are separately controlling excess construction charges (ECCs), accommodation services and AISBO services in the WECLA, covering AISBO services up to and including 1Gbit/s inside the WECLA.

1.78 Our controls for the TI basket and Ethernet basket are RPI+2.25% and RPI-11.50% respectively. These controls have changed from RPI+2.50% and RPI -11.0% respectively as set out in the draft Statement. These changes followed the announcement of the Budget 2013 by the Chancellor, resulting in a change of the tax rate used in our WACC calculation, and a correction of an error in our model impacting the calculation of Ethernet costs. In respect of the AISBO services up to and including 1Gbit/s in the WECLA, we are applying a safeguard cap of RPI-RPI on each relevant service.

1.79 For ECCs, we are implementing average starting charge adjustments of -29% and then a sub-cap of GBCI -0% on each charge. For accommodation services, we concluded on a sub-cap of RPI-0% on each charge.

1.80 For TI retail analogue services we are imposing a safeguard cap, which is set at the same level as the overall TI basket of RPI+2.25%.

1.81 The table below summarises our conclusions.

Summary of charge controls imposed on BT

	Services within scope	Value of X	Sub baskets & Sub-caps*
TI basket	Connection and rental charges for:	RPI+2.25%	Point of Handover sub-basket (RPI-0%)
	Wholesale low, medium and high bandwidth PPCs outside the WECLA		RBS, Netstream 16 Longline and SiteConnect sub-basket (RPI+2.25%)
	Wholesale low bandwidth PPCs inside the WECLA		Ancillary services, equipment and infrastructure sub-cap (RPI+2.25%)
	Regional Trunk (all bandwidths) - rental only		TI all services sub-cap (RPI+10%)
	RBS, Netstream 16 Longline and SiteConnect		

TI equipment and infrastructure
 TI ancillary services(excluding ECCs)
 Interconnection services

	Connection and rental charges for:		
	Ethernet services (up to and including 1Gbit/s) outside the WECLA		Interconnection services sub-basket (RPI-11.5%)
Ethernet basket	Ethernet services (above 1Gbit/s) outside the WECLA	RPI--11.5%	EAD 1 Gbit/s sub-basket (RPI-11.5%)
	Ethernet ancillary services (excluding ECCs)		Ethernet all services sub-cap (RPI-RPI)
	Interconnection services		
Excess Construction Charges		GBCI-0% on each charge	
Accommodation services	Access Locate Administration Fee Cablelink	RPI-0% on each charge	
AISBO services in the WECLA	Wholesale low bandwidth AISBO services (up to and including 1Gbit/s) in the WECLA	RPI-RPI on each charge	
Retail Analogue basket	Rental charges	RPI+2.25%	Retail analogue sub-cap (RPI+10%)

**A sub-basket control applies to the weighted average value of revenues of services within the basket. This is in contrast to a sub-cap which applies to each charge.*

1.82 We consider that these charge controls are sufficient to constrain BT's pricing. They will provide incentives to make efficiency improvements and are appropriate for achieving the other objectives pursued. We are therefore not imposing a cost orientation obligation in addition to these charge controls.