

BEFORE THE
Federal Communications Commission
WASHINGTON, D.C.

In the Matter of)
)
Inquiry Concerning the Deployment of)
Advanced Telecommunications)
Capability to All Americans in a Reasonable) GN Dkt. No. 07-45
and Timely Fashion, and Possible Steps)
to Accelerate Such Deployment)
Pursuant to Section 706 of the)
Telecommunications Act of 1996)

COMMENTS OF TIME WARNER TELECOM, INC.

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Time Warner Telecom, Inc. (“TWTC”), by its attorneys, hereby files these comments in response to the 5th Annual NOI on Broadband Deployment.¹

I. INTRODUCTION AND SUMMARY

Business-class broadband services are crucial to the U.S. economy and society. Application service providers, online retailers (an increasingly significant component of the economy), healthcare providers, and all other businesses that rely on connectivity can function more efficiently if high bandwidth services are available at reasonable prices. Similarly, national, state and local governments can more effectively serve their citizens when they can

¹ *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Notice of Inquiry, GN Docket No. 07-45 (rel. Apr. 16, 2007) (“NOI”).

depend on reliable broadband connections efficiently provided. Consumers also rely on broadband connections serving their places of employment as their only means of accessing the Internet. In 2004, the FCC concluded that “64 percent of people who are employed full or part-time go online in the workplace. Of this group, 67 percent of people who are employed full or part-time go online using a high-speed connection.”² This is likely still true today. Moreover, in 2006, eight percent of Americans relied on Internet access at work as their sole source of connectivity.³ In addition, consumer broadband access is valueless unless the businesses and government agencies with which consumers seek to communicate do not have efficient broadband connectivity. For these reasons, high prices and foregone innovation in the provision of broadband services suitable for business applications have ripple effects throughout the economy and society.

Despite the importance of broadband for businesses, the FCC has done nothing to promote deployment of these services and it has done nothing to study the full extent of existing market failures in this area. As the GAO has recently demonstrated, the Commission’s lack of attention to business-class broadband deployment has had important negative consequences. In 1999, the FCC price-deregulated special access, including DS1 and DS3 services, based on the assumption that substantial facilities-based competition would restrict the ability of ILECs to exercise their market power. The Commission subsequently eliminated unbundling for broadband, packetized loops needed to serve businesses. The FCC has for at least 4 years

² See *Availability of Advanced Telecommunications Capability in the United States*, Fourth Report to Congress, at 33 (2004).

³ See Pew Internet & American Life Project, *Home Broadband Adoption 2006* (May 28, 2006), available at http://www.pewinternet.org/pdfs/PIP_Broadband_trends2006.pdf (last visited May 16, 2007).

understood, however, that carriers generally cannot deploy broadband facilities at a DS3 capacity or lower because the revenue opportunities associated with such services do not make up for the cost of deployment. Yet, the FCC has never addressed the consequences of this problem for special access prices and has not even studied the business class broadband transmission market nationwide or in those markets where pricing flexibility has been granted.

After conducting its own study, the GAO determined last year that the FCC has eliminated price regulation of ILEC broadband facilities used to serve businesses in many markets with little actual CLEC facilities deployment. As a result, the GAO confirmed what many had suspected; in those markets where price regulation had been eliminated, ILECs have exercised their market power to raise rates.

The FCC's failure to take action to promote deployment of business-class broadband services represents a fundamental abdication of its responsibility to ensure the reasonable and timely deployment of broadband under Section 706 of the Communications Act. There is simply no way to justify the Commission's inattention to broadband services that are essential to the economy and government. All of the available data indicates that ILECs continue to possess market power over transmission facilities serving the business market. Moreover, TWTC's own experience demonstrates that the incumbents are abusing that market power to stunt the deployment of critical broadband services such as Ethernet. The FCC should therefore act immediately to, among other things, place ILEC special access and Ethernet facilities under price caps and ensure that packetized UNEs are available. Similar regulation in the UK and Japan has shown that increased price regulation of TDM and packetized incumbent facilities has lowered prices, increased consumer choice and has had no material negative impact on ILEC investment incentives.

But the Commission must also collect detailed information about the extent of business class broadband deployment so that it can make appropriate adjustments to its regulatory regime going-forward. In so doing, the Commission should adopt a consistent and sound means of defining the relevant product and geographic markets, such as the DOJ/FTC horizontal merger guideline methodology. It should then collect information regarding facilities-based deployment for each relevant business market. For example, the FCC should track the extent to which carriers are deploying Ethernet facilities, as Ethernet is becoming increasingly demanded by businesses. As an initial matter, the FCC should examine a handful of geographic areas across the country to obtain a better understanding of the scope of CLEC facilities deployment to the business market. Only a combination of initial action to address a known problem and further study of market realities will fulfill the Commission's Section 706 charge to promote deployment of broadband to businesses.

II. PAST SECTION 706 REPORTS HAVE FAILED TO ANALYZE THE EXTENT TO WHICH BUSINESS CLASS BROADBAND IS BEING DEPLOYED

While the FCC has focused on mass market broadband services in its past 706 reports, it has not specifically tracked broadband services offered to businesses or taken into account the substantial differences in broadband technologies used to serve businesses and mass market customers. Given the well-known market failures in the business market, this is an obvious and significant problem. Moreover, past Commission conclusions that advanced services are being deployed on a reasonable and timely basis are of no relevance to business class broadband services.

First, past reports have focused almost exclusively on residential/SOHO mass market offerings largely limiting the analysis and data collection to DSL, cable modem and satellite

service. As the FCC has repeatedly found, these services are generally not capable of serving any but the very smallest business customers.⁴

Second, the FCC's data has failed to capture the different technologies demanded by business customers. The industry is fast deploying and businesses are increasingly demanding IP-based products that offer high levels of scalability and flexibility not previously offered by circuit-switched, TDM-based offerings.⁵ Business class Ethernet service is a prime example of such a new product. Unlike TDM-based broadband services, Ethernet can be delivered at highly flexible capacities, can provide advanced quality-of-service and packet prioritization features, and can connect directly with customers' LANs without protocol conversions from TDM-to-Ethernet. These attributes provide substantial cost savings and valuable features to businesses. Moreover, unlike other packetized services like Frame Relay or ATM, Ethernet provides true multi-point to multi-point connectivity, allowing businesses to tightly integrate their operations in multiple offices using IP-VPN services.⁶ The Commission has completely neglected the promotion and study of these services.

Third, the FCC's data collection scheme focuses on metrics that are not necessarily relevant to business customers. For example, the FCC seems to believe that increases in bandwidth are a clear indicator that broadband services are becoming more advanced, feature-

⁴ See, e.g., *Unbundled Access to Network Elements; Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Order on Remand, 20 FCC Rcd 2533, ¶¶ 39, 193 (2005) ("TRRO").

⁵ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853, ¶ 39 (2005).

⁶ Cisco Systems, White Paper, "Understanding Intelligent Carrier Ethernet: Bringing the Advantages of Ethernet to the Service Provider," at 1 (October 2003), available at http://www.cisco.com/warp/public/cc/techno/lnty/etty/ggetty/prodlit/intgn_wp.pdf (last visited May 16, 2007).

rich and useful.⁷ But bandwidth is not the only factor that determines businesses' purchasing decisions. For example, broadband services demanded by businesses in some cases actually provide lower downstream bandwidth than the highest grade-consumer broadband service. Many cable companies provide "business class" cable modem service at downstream speeds of up to five Mbps for approximately \$100.⁸ By contrast, Ethernet and TDM-based services that provide similar or less downstream bandwidth are sold for several times that amount by TWTC and other carriers. That is because Ethernet and TDM-based services provide advanced features and services, including high security, guaranteed reliability and compatibility with PBX systems and have the ability to provide multiline or directory number hunt services that may not be available from mass market DSL and cable modem services.⁹ As the FCC found in the *TRRO*, the fact that cable modem and TDM-based broadband services command very different prices seems to indicate that these services belong in different product markets.¹⁰

⁷ See Industry Analysis and Technology Division, Wireline Competition Bureau, FCC, High-Speed Services for Internet Access: Status as of June 30, 2006, at Table 5 (showing high-speed lines by information transfer rates as of June 30, 2006).

⁸ See, e.g., Time Warner Cable Business Services, http://www.twcny.com/index2.bus.cfm?c=new_bus/roadrunner (last visited on May 16, 2007) (offering Business Class Pro high-speed Internet service at downstream speed of up to 5 mbps for \$109.95 per month in the New York metropolitan area).

⁹ See *Ex Parte* Letter from John T. Nakahata, Counsel to General Communication, Inc., to Marlene Dortch, Secretary, FCC, WC Docket No. 05-281, at 6 (filed Nov. 14, 2006); *TRRO* ¶ 193 ("Competitive LEC commenters explain that bandwidth, security, and other technical limitations on cable modem service render it an imperfect substitute.").

¹⁰ See *id.* ¶ 193 ("Commenters also note that businesses that do not require DS1 loops are willing to pay significant more for them than the costs of a cable modem connection, which also indicates that the two are not interchangeable."); see also *id.* n.119 (quoting ALTS Reply Comments at 33).

Fourth, the FCC has also focused on the extent to which the number of fiber loops has increased nationally, but this is not a particularly reliable indicator of the extent to which competition has developed or deployment achieved in the business market. Most importantly, the fact that a service is delivered over copper or fiber does not necessarily indicate whether the service is capable of serving the business market. For example, many DS-1 services are actually provided over copper loops. Advances in recent years have also permitted carriers to provide Ethernet and other high capacity services demanded by businesses over copper loops. Indeed, many carriers are now using leased ILEC copper loops to provide Ethernet-over-copper at symmetrical bandwidths of up to 50 mbps/sec.¹¹ At the same time, certain fiber-based, very high bandwidth services such as Verizon's FiOS are marketed almost exclusively to the mass market no doubt because they lack features demanded by most business customers. Therefore, the increasing deployment of fiber, while relevant, is not dispositive of whether businesses are better served by facilities-based broadband providers than has been the case in the past.

Finally, as the GAO and others have indicated, the FCC's collection of broadband deployment within areas associated with zip codes does not provide an accurate picture of broadband deployment for businesses. To begin with, the FCC's data does not provide any evidence of *facilities-based* deployment, it merely shows that customers are receiving service in that zip-code.¹² In addition, the zip-code level does not show how many business connections

¹¹ See Craig Matsumoto, Copper Ethernet Makes Strides, LIGHT READING, in UNSTRUNG.COM, June 6, 2006, at http://www.unstrung.com/document.asp?doc_id=96236.

¹² See GAO, Broadband Deployment Is Extensive throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas, GAO-06-426, at 3 (Washington, D.C., May 2006) ("GAO Broadband Report"). ("[F]or its zip-code level data, the FCC collects data based on where subscribers are served, not where providers have deployed broadband infrastructure; *id.* at 5 ('ultimately, we found that a key difficulty for analyzing and targeting any federal aid for broadband is a lack of reliable data on the deployment of networks.'").

are actually present in each zip code area, merely the number of providers serving each zip-code area, thereby potentially overstating the extent to which broadband is deployed to businesses. *See id.* at 14. Moreover, the FCC’s data does not indicate whether carriers serving the zip-code area are providing services that are suitable for business customers. The FCC’s broadband reports also treat UNE-based deployment in the same manner as facilities-based deployment. As the GAO correctly states, “counting [UNE-based] providers in the zip-code level data may overstate the extent of local infrastructure deployment....” *Id.* at 17.

III. THE FCC’S FAILURE TO ADEQUATELY ANALYZE FACILITIES DEPLOYMENT TO BUSINESSES HAS PREVENTED THE FCC FROM PROMOTING BUSINESS-CLASS BROADBAND SERVICES

In a report released last year, the GAO demonstrated that the failure of the FCC to adequately track the deployment of facilities capable of serving businesses has harmed consumer welfare and prevented the FCC from effectively regulating ILEC market power in the provision of business class broadband.¹³ The GAO report shows that the FCC’s failure to collect actual facilities-deployment data in the business market has led to special access price deregulation in those markets where there is little actual facilities-based competition.

As the FCC has repeatedly recognized, the extent to which ILECs control bottleneck connections serving business end user locations is the most important measure of ILEC market power in this market.¹⁴ In the 1999 special access *Pricing Flexibility Order*, the FCC established certain proxy “triggers” based on collocations and special access revenue that it believed would

¹³ *See generally* GAO Special Access Report.

¹⁴ *See e.g., Implementation of the Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934, as amended, Order on Reconsideration, 12 FCC Rcd 8653, ¶ 10 (1997).*

predict where competitors had deployed sufficient facilities to ameliorate ILEC market power.¹⁵

In those markets where the triggers were met, ILECs are relieved of price regulation over their special access services. In light of numerous complaints that these triggers did not adequately predict where CLEC facilities had been deployed, the GAO examined CLEC loop deployment in 16 MSAs. ILECs have been granted full pricing flexibility under the *Pricing Flexibility Order* in many of these markets.

The GAO found that CLEC facilities deployment was extremely limited in nearly all of the markets examined. The GAO determined that ILECs owned the only loop facility serving over 90 percent of the commercial buildings in nearly every market studied. *See* GAO Special Access Report at 20. On average, competitors served “less than 6 percent of buildings with at least a DS-1 of demand.” *Id.* at 12. Some of the lowest levels of deployment were found in those markets where pricing flexibility had been granted. *Id.* at 13. Given the low level of facilities based competition in those markets where full pricing flexibility had been granted, it is unsurprising that special access prices were higher in those markets than in markets where pricing regulation remained in place (*id.*); ILECs are simply exploiting the opportunity to exercise their market power to raise rivals’ costs. It is clear from the GAO study that there was little to no relationship between price deregulation and actual CLEC facilities deployment.

IV. THE COMMISSION MUST ACT NOW TO CORRECT ERRORS IN ITS REGULATION OF ILEC TRANSMISSION FACILITIES SERVING THE BUSINESS MARKET.

The FCC has consistently found that carriers seeking to serve the enterprise market generally cannot deploy facilities that yield revenues equal to or less than those offered by a

¹⁵ *Access Charge Reform Price Cap Performance Review for Local Exchange Carriers*, Fifth Report and Order and Further Notice of Proposed Rulemaking, 14 FCC Rcd 14221 (1999) (“*Pricing Flexibility Order*”).

single DS3 loop. As the FCC found in the *TRO*, “the cost to deploy local loops at any capacity is great” and the cost of deploying loops “does not vary based on capacity.”¹⁶ Accordingly, competitors can only self-deploy loops in “locations where there is sufficient demand from a potential customer base . . . to generate a revenue stream that could recover the sunk construction costs of the underlying loop transmission facility.” *Id.* Because loops providing less than a single DS3 of capacity do not provide sufficient revenue to make up for the costs of loop construction, carriers are impaired without access to such loops and must rely on the ILEC in most instances.¹⁷ Moreover, since the release of the *TRO*, market analysis conducted by the FCC¹⁸, DOJ¹⁹ and GAO²⁰ all confirm that there is virtually no competition in the provision of

¹⁶ *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Report and Order and Order on Remand, 18 FCC Rcd. 16978, ¶ 303 (2003) (“*Triennial Review Order*” or “*TRO*”).

¹⁷ *See id.* ¶ 248 (competitors are impaired without conditioned copper loops); *id.* ¶ 325 (competitors are impaired without DS1 loops). In the *TRO*, the FCC found that competitors are impaired without access to two DS3 loops per location. *See id.* ¶ 324. The FCC later limited its impairment finding to a single DS3 loop in the *TRRO*. *See TRRO* ¶ 177.

¹⁸ *See TRO* ¶ 298 n.856 (stating that both “competitive LECs and incumbent LECs report that approximately 30,000, *i.e.*, between 3% to 5%, of the nation’s commercial office buildings are served by competitor-owned fiber loops”).

¹⁹ *United States v. Verizon Communications, Inc. and MCI Inc.*, Case No. 1:05CV02103, Department of Justice Complaint ¶ 15 (D.D.C. filed Oct. 27, 2005) (“For the vast majority of commercial buildings in its territory, Verizon is the only carrier that owns a last-mile connection to the building.”); *United States v. SBC Communications, Inc. and AT&T Corp.*, Case No. 1:05CV02102, Department of Justice Complaint ¶ 15 (D.D.C. filed Oct. 27, 2005) (“For the vast majority of commercial buildings in its territory, SBC is the only carrier that owns a last-mile connection to the building.”).

²⁰ *See* GAO Special Access Report at 42 (stating that “wireline facilities-based competition itself may not be a realistic goal for some segments of the market for dedicated access. . . . Where demand for dedicated access is less than 3 or 4 DS-1’s, it would appear unlikely that any competitor would extend its network for that business”).

loop facilities needed to provide services delivering revenue opportunities offered by a single DS3 or below. *See Id.*

It is important to emphasize that that the ILECs' dominance in the broadband transmission market is not restricted to traditional TDM-based services. Rather, their market power extends to packetized services that yield revenue opportunities equal to or below those offered by a single TDM-based DS3. While Ethernet provides new and innovative features, it is delivered over the same copper and fiber loops used to provide TDM-based services. Yet, the economic analysis of loop deployment does not change with the introduction of new and innovative technologies. The same trench must be dug, the same fiber must be laid, and similarly priced electronics must be attached to deliver Ethernet and other packetized services. To the extent that the revenue generated by an Ethernet loop does not justify the cost of construction, CLEC deployment is of course not possible, and ILECs will retain their dominant position.

Changing market conditions are also making CLECs more reliant on ILEC facilities even as some CLECs like TWTC continue to construct high capacity loops to businesses in those cases where the economic case makes sense. Customers are increasingly demanding that their service providers take advantage of the efficiencies offered by IP to integrate all of their communications needs on a single network serving all (or virtually all) of a customer's locations. This development has increased the *number* of ILEC loop facilities that TWTC must purchase, because it is inefficient for TWTC to deploy its own loop facilities in many of the new locations that TWTC must now reach.

There is also evidence that ILECs are exploiting their control over bottleneck end user connections to control the pace at which competitors roll out next-generation facilities, thereby

frustrating the goals of Section 706. The incentive and ability of ILECs to engage in such discrimination is amplified as CLECs increasingly rely on ILECs to serve customer locations that cannot be reached with their own facilities. As TWTC explained at length in prior proceedings, ILECs, especially AT&T, have failed to offer a contract tariff that would provide wholesale Ethernet loops to TWTC on just and reasonable terms.²¹ At the same time, AT&T's standard tariffed Ethernet rates are well above the level at which TWTC can economically utilize those services as inputs. As a result, TWTC purchases *no* Ethernet loops from AT&T. Instead, to provide retail Ethernet service in AT&T's region, TWTC is forced to rely upon a combination of (1) its own loops in the minority of cases where construction is economically feasible and (2) AT&T TDM special access facilities. However, providing Ethernet over TDM special access facilities is not a viable long-term means of providing Ethernet. In fact, over time, reliance on TDM transmission inputs will substantially reduce the size of TWTC's addressable market. *See id.* ¶¶ 17-25. Moreover, by reducing TWTC's addressable market, ILECs like AT&T reduce deployment of Ethernet services to businesses in direct contradiction to the policy goals of Section 706.

Given the actions of ILECs with respect to their wholesale transmission facilities serving businesses and the available data from the FCC, DOJ and GAO, the FCC need not wait for further confirmation of the ILEC's possession and abuse of their market power before taking the necessary steps to promote the goals of section 706 in business markets. Specifically, the Commission must focus on limiting the harmful consequences of ILEC market power through effective unbundling and rate regulation, including by extending unbundling obligations to

²¹ *See* Reply Declaration of Graham Taylor, attached to ex parte filing of Time Warner Telecom, WC Dkt. No. 06-74 (filed Aug. 8, 2006).

packetized loops, ensuring that all special access services are under price-caps, prohibiting conditions on obtaining volume/term discounts that bear no relationship to the efficiencies yielded by volume/term and by initiating a rulemaking to establish regulations governing ILECs' provision of Ethernet loops and IP-VPN service.²² These basic steps will limit the extent to which ILECs continue to delay deployment of broadband services to businesses.

V. THE EXPERIENCE OF OTHER COUNTRIES DEMONSTRATES THAT REGULATION OF ILEC BROADBAND FACILITIES INCREASES CONSUMER CHOICE, LOWERS PRICES AND DOES NOT NEGATIVELY EFFECT ILEC INVESTMENT INCENTIVES.

Evidence from other countries demonstrates the utility of appropriately tailored regulation to promote broadband deployment. *First*, countries that have required ILECs to unbundle or price regulate their broadband loops have experienced faster broadband penetration rates, lower average prices and increased innovation than is the case in the U.S. For example several years ago, OfCom (the UK telecom regulatory authority) ordered BT to offer packetized and TDM-based UNEs (called local loop unbundling or "LLU")²³ at prices based on forward-looking cost. There are now 1.3 million LLUs leased by competitors, accounting for 10 percent of all broadband connections. *Id.* at i. OfCom explains that the LLU policies have "led to a continued decline in broadband prices." *Id.* at 14. Eight Mbps of broadband is now available for

²² The conditions placed on the AT&T/BellSouth transaction demonstrate that the FCC understands that it must act on these concerns. Among other things, the Commission required that the merged parties comply with (1) special access and Ethernet rate reductions (2) the elimination of Phase II pricing flexibility; and (3) the elimination of any special access contract tariffs that require the CLEC to restrict its purchases of UNEs. *See AT&T Inc. and BellSouth Corporation Application for Transfer of Control*, Memorandum Opinion and Order 22 FCC Rcd 5662, Appendix F (2007).

²³ OfCom, *The Communications Market: Broadband; Digital Progress Report* (Apr. 2, 2007), available at http://www.ofcom.org.uk/research/cm/broadband_rpt/broadband_rpt.pdf (last visited May 16, 2007).

£10 from some LLU operators, down from £40 in 2004. *See id.* In fact, broadband is now cheaper than dial-up in the UK. *See id.* Overall broadband penetration has increased from approximately 7 percent in 2002 to 50 percent in 2006. *Id.* at i. As a result of OfCom’s policies, BT serves only one quarter of the retail broadband market. *Id.* at 5. BT’s wholesale Ethernet service “costs a quarter to a half of the prices charged by Verizon ILEC, Verizon Business, and BellSouth.”²⁴ All of BT’s special access facilities are price capped and prices decrease every year. *Id.* at 11. BT’s wholesale DS1 and DS3 rates are substantially lower than the least expensive price cap ILEC’s rates in the U.S. *Id.* at 12-16.

Fiber loop unbundling obligations placed on NTT have had a similarly salutary effect on the broadband market in Japan. As a result of regulatory decisions, there is fierce broadband competition in Japan and 7.2 million customers are served via FTTP services offered by NTT and others over NTT’s FTTP loops.²⁵ Softbank and eAccess, which rely on unbundled loops purchased from NTT, serve approximately 36 percent and 13 percent respectively of the DSL customers in Japan. NTT serves approximately 39 percent of the DSL market. *See Ebihara Speech.* Competitors using unbundled FTTP loops control 12 percent of that market. *See id.* This competition has resulted in low prices and high bandwidth provided to consumers. By 2005, a 50 Mbps broadband service cost only \$30 per month on average in Japan. *See id.* The average monthly price per Mbps dropped 47 percent from 2000 to 2005 and is now lower than

²⁴ Presentation of Sheba Chacko, Head, Global Operational Regulation and Americas Regulation, BT, at 9, attached to UK Investment, Innovation and Competition Briefing accompanying presentation given by BT (Apr. 23, 2007) (“*BT Slides*”) (attached hereto as Exhibit A).

²⁵ Presentation at 7, accompanying speech of Taka Ebihara, Office of the Japan Chair, Center for Strategic and International Studies (Apr. 4, 2007), available at <http://video.google.com/videoplay?docid=-4295589897838768596&q=ntt+broadband&hl=en> (last visited May 16, 2007) (“*Ebihara Speech*”)

all other western countries. *See id.* Prices per Mbps in Japan are lower than in any other country. A single Mbps of bandwidth currently costs \$.70 per month in Japan, whereas a single Mbps of bandwidth costs \$4.90 per month (seven times as much) in the United States. *See id.*

Second, experience in other countries also demonstrates that unbundling and price regulation has no material negative effect on ILEC deployment of broadband networks. As BT has explained, it spent many billions of dollars to make substantial upgrades to its core network, increase capacity and eliminate redundant network architecture.²⁶ BT estimates that the network upgrade will save over one billion pounds per year. *See id.* at 1. Because of these substantial cost savings, it made the decision to upgrade its network despite its substantial unbundling and network sharing obligations. Unlike ILECs in the U.S., BT has explained that it “does not seek a regulatory ‘holiday’” to make substantial network investments. *See id.* at 14. In Japan, NTT’s obligations to unbundle FTTP have apparently not inhibited its deployment of its FTTH networks. Notwithstanding NTT’s duty to unbundle FTTP loops, a higher percentage of end-users are served by FTTP facilities in Japan than is the case in United States. *See Ebihara Speech.*

The available market evidence from the UK and Japan demonstrates that the Commission has understated the benefits and overstated the costs of unbundling regulation applicable to incumbent LECs. This is especially relevant in the business market in the U.S., since there is relatively little facilities-based competition in that market. The available evidence therefore confirms that more stringent and effective regulation of ILEC market power in the business market will promote the goals of Section 706.

²⁶ Presentation of Daryl Dunbar, Director, Portfolio Manager, BT, at 2-6, attached to *BT Slides*.

VI. THE COMMISSION MUST NOW BEGIN TRACKING THE DEPLOYMENT OF BUSINESS CLASS BROADBAND SERVICES.

While the Commission must act promptly to address proven shortcomings in its regulations governing business class broadband services, it must also improve its information gathering process going-forward. As the GAO observed, the FCC does not currently collect the data necessary to make a full evaluation of its rules regulating prices charged for transmission facilities serving the enterprise market.²⁷ Indeed, it should not have taken seven years after the adoption of the *Pricing Flexibility Order* for an agency *other than the FCC* to have documented the absence of CLEC loop deployment in those markets where pricing flexibility has been granted. It is therefore crucial that, with respect to the business market, the FCC begin “collecting additional data and developing additional measures to monitor competition on an ongoing basis that more accurately represents market developments and individual customer choice.” GAO Special Access Report at 44.

The GAO makes clear that one-time data collections as part of adversarial proceedings are not an adequate substitute for regular data collection.²⁸ The FCC did request broadband data as part of its special access rulemaking proceeding, but this data was not submitted in a neutral, standardized fashion and therefore may be “of limited reliability.” *Id.* at 43. Rather the FCC

²⁷ See GAO Special Access Report at 43 (“[I]t is clear that [the] FCC does not regulatory monitor and measure the development of competition, which will affect how [the] FCC response to emerging trends, and the actions it takes to encourage and foster such competition....Without data that are reliable, relevant and current, the FCC is limited its ability to adequately monitor the state of competition for dedicated access, and thus is limited in its ability to determine whether its predictive judgments were correct, and whether its deregulatory actions are achieving their goals.”).

²⁸ The GAO’s special access market-by-market study provided important information, but that study had certain shortcomings, including reliance on third party GeoResults data, its failure to analyze the Ethernet market, and its one-time nature. For these reasons, it is important that the FCC tracks facilities-based competition in the business market on an ongoing basis.

must collect data in a regularly scheduled, ongoing manner so that the Commission's rules reflect marketplace realities.

In light of the GAO's findings and of the importance of business class broadband to the policy goals of Section 706, the FCC must modify its data collection requirements to ensure that it accurately tracks the extent of facilities-based competition in the business market. As suggested by the FCC itself in the NOI (*see NOI* ¶ 24), the FCC must begin by analyzing the various markets for broadband services, and collect data for to *all* broadband product markets.

As an initial matter, the FCC must define the relevant markets. A sensible starting point would be to employ the market definition test established by the DOJ/FTC horizontal merger guidelines. Indeed, the FCC has often done so as part of its merger analysis.²⁹ Section One of those guidelines defines a relevant market as a "product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a 'small but significant and nontransitory' increase in price, assuming the terms of sale of all other products are held constant."³⁰ For example, as discussed above, because businesses regularly purchase DS-1 and low-capacity Ethernet services at many times the price of ADSL and cable modem services, it must be that these different transmission technologies belong to different product markets. Indeed, at the very least, the FCC should define the relevant product markets as (1) mass market/SOHO (which would include cable modem/DSL); (2) small/medium business (DS1 up to a DS3 or Ethernet at up to 45 Mbps of

²⁹ *See, e.g., Verizon Communications Inc. and MCI, Inc. Applications for Approval of Transfer of Control*, Memorandum Opinion and Order, 20 FCC Rcd 18433, ¶ 21 & nn.82-83 (2005).

³⁰ U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines* §§ 1.11, 1.12 (Apr. 2, 1992, revised Apr. 8, 1997).

capacity); and (3) large business/enterprise (DS3 and above or Ethernet at greater than 45 Mbps of capacity). Also, as described above, because Ethernet and similar advanced packetized services offer features not available from traditional TDM-based services, data on such services should be collected separately.

To determine whether broadband markets are competitive and the effect of market power on broadband deployment, the Commission must determine the extent to which incumbent LECs control upstream bottleneck end user connections needed to provide broadband to businesses and the consequences of such control.³¹ The most appropriate way for the Commission to track competition in the business markets is by examining the extent to which competitors have deployed end user connections to particular building locations. If conducted on a national basis, however, such an approach might become overly burdensome. Accordingly, it would be prudent for the Commission to conduct a study of business market competitiveness in representative urban areas – for example in three large, three medium and three small urban areas. Within each area, the FCC should obtain the number of providers and broadband connections per relevant geographic market (*e.g.*, building).³² The FCC should also compare the prices of ILEC and CLEC TDM and packetized services offered in these markets at both the wholesale and retail levels. One way would be to analyze the prices of bandwidth on a per-megabit basis.

VII. CONCLUSION

The FCC should adopt the forgoing recommendations.

³¹ As the GAO has recognized, the extent to which competitors deploy UNEs has no bearing on the extent of competitive deployment. *See* GAO Broadband Report at 17.

³² The FCC has already undertaken similar information collection in evaluating requests by Qwest and ACS for forbearance from UNE obligations.

Appendix A

UK: Investment, Innovation and Competition
Enabled by Regulation



Introduction

- The UK has one of the most competitive telecom markets in the world
- BT is investing GBP 10 billion in its next generation network 21CN
- Take-up of broadband in the UK is higher than in the USA, average broadband speeds are higher and pricing is more competitive
- Enterprise access prices are lower, access speeds are more varied and the variety of bandwidths is more widely available in the UK than the USA
- These developments are taking place as a result of, and not despite, heightened access regulation in the UK



BT's NGN: 21CN

Daryl Dunbar

Director Portfolio Innovation

Washington DC
April 2007



BTS 21CN Programme is a Business Transformation

BT is addressing the tough telecoms challenges of today with our **21CN NGN Programme**; this is not just a network replacement, it is a total **business transformation**

21CN is made up of a number of inter-linked & inter-dependant initiatives:

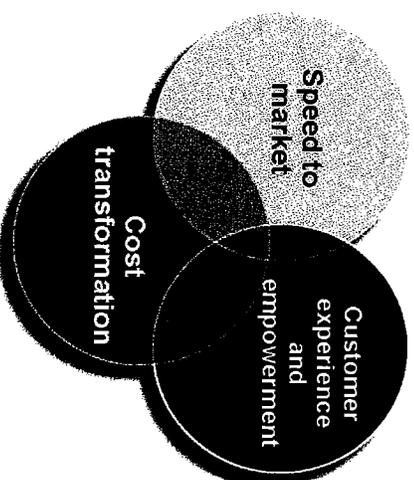
- Remaking our Portfolio
- Transforming Systems
- Core Network Convergence
- 21C Customer Experience

} A total business program to optimise NGN benefits

- Empower the customer with control, choice and flexibility like never before
 - including communications from anywhere to any device
- Offer exciting new services for customers faster than before
- Reduce costs and grow cash cost savings
 - expected to amount to £1 billion per annum by 2008/9

The vision is for a zero-touch network where services are software defined, automated & initiated by customers

BTS 21CN Objectives....

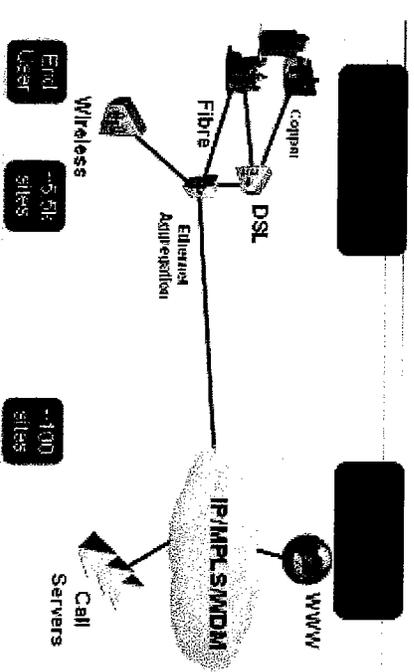
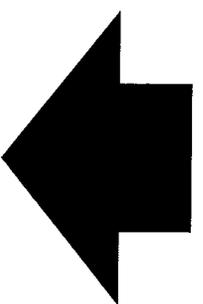
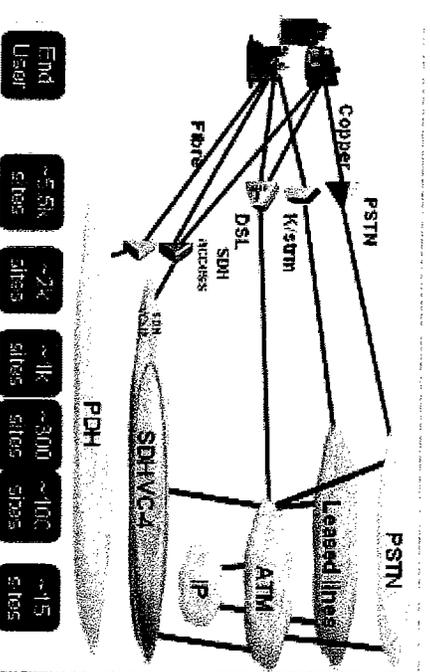


Converged Core

- Reducing complexity
- Eliminating 100,000 network components
- A single platform that is multi-service and future proof on IP
- Optimised for reliability and performance

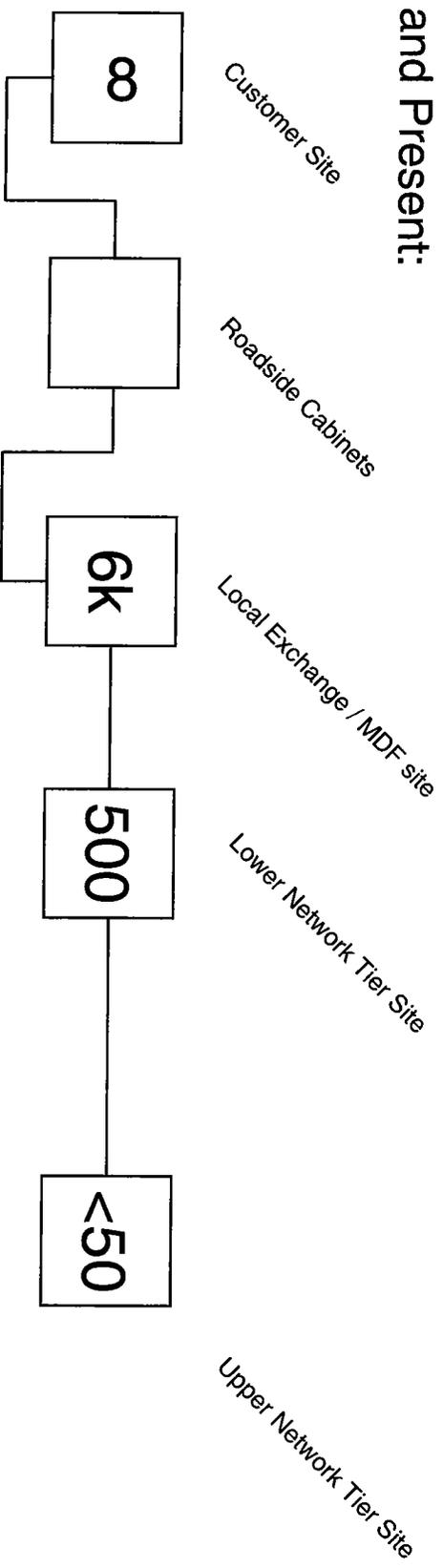
Generally, this is the structure all NGNs are taking, few start in the core, many start at the edge

The gap between local network elements and core network elements generally widens

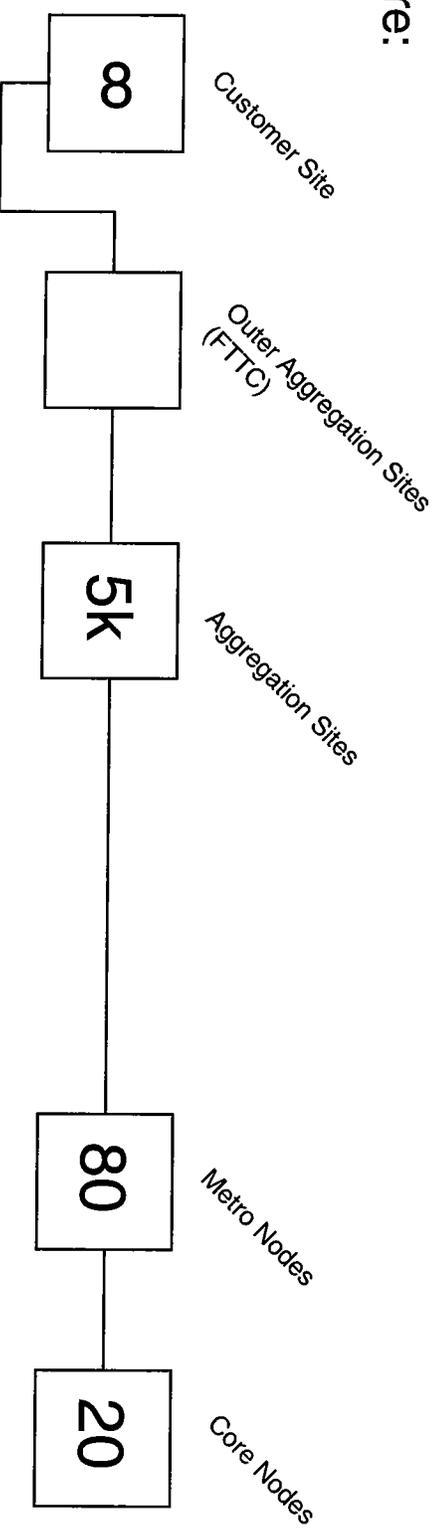


Network element figures* - issues created by NGNs

Past and Present:



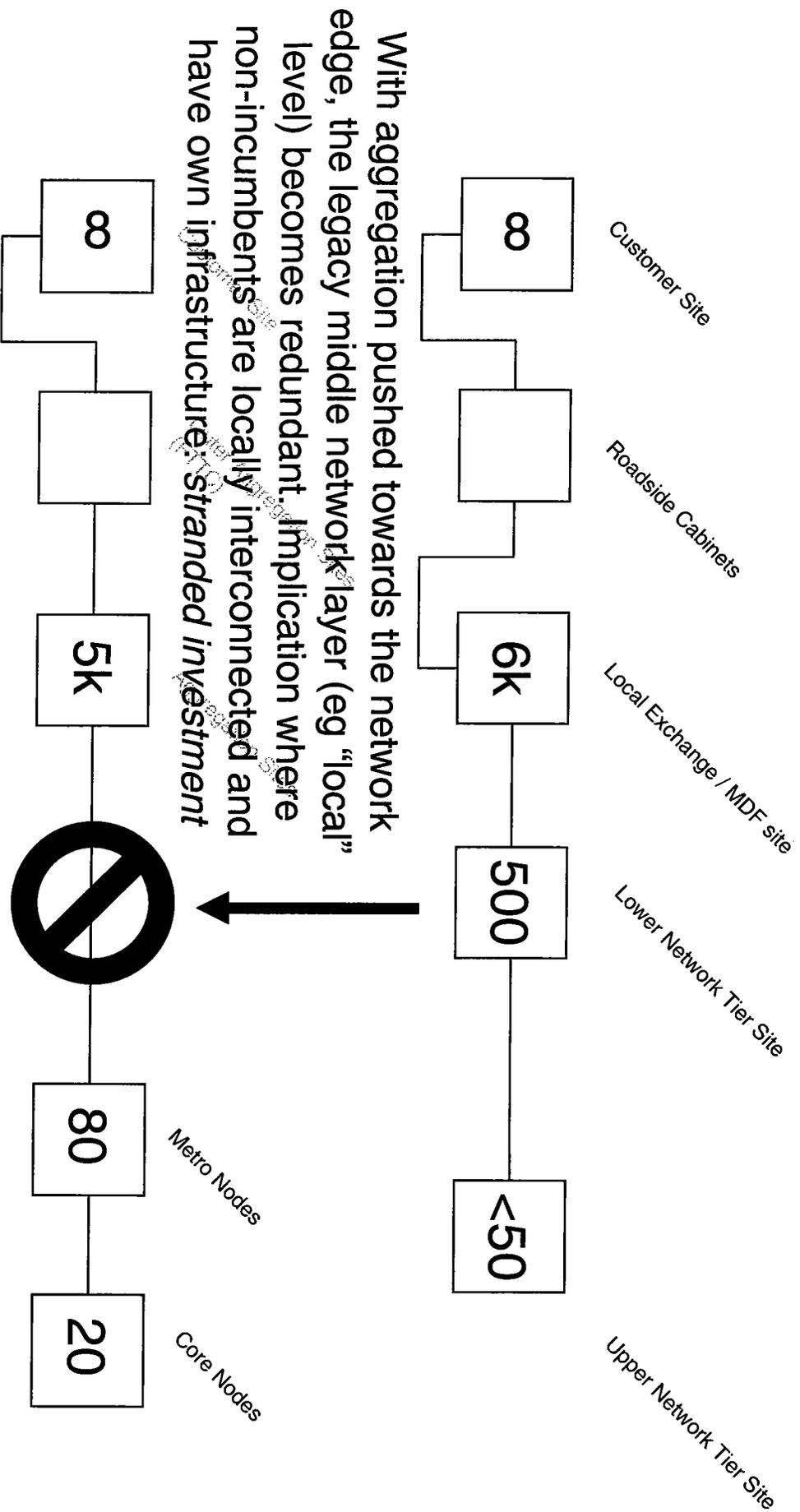
Future:



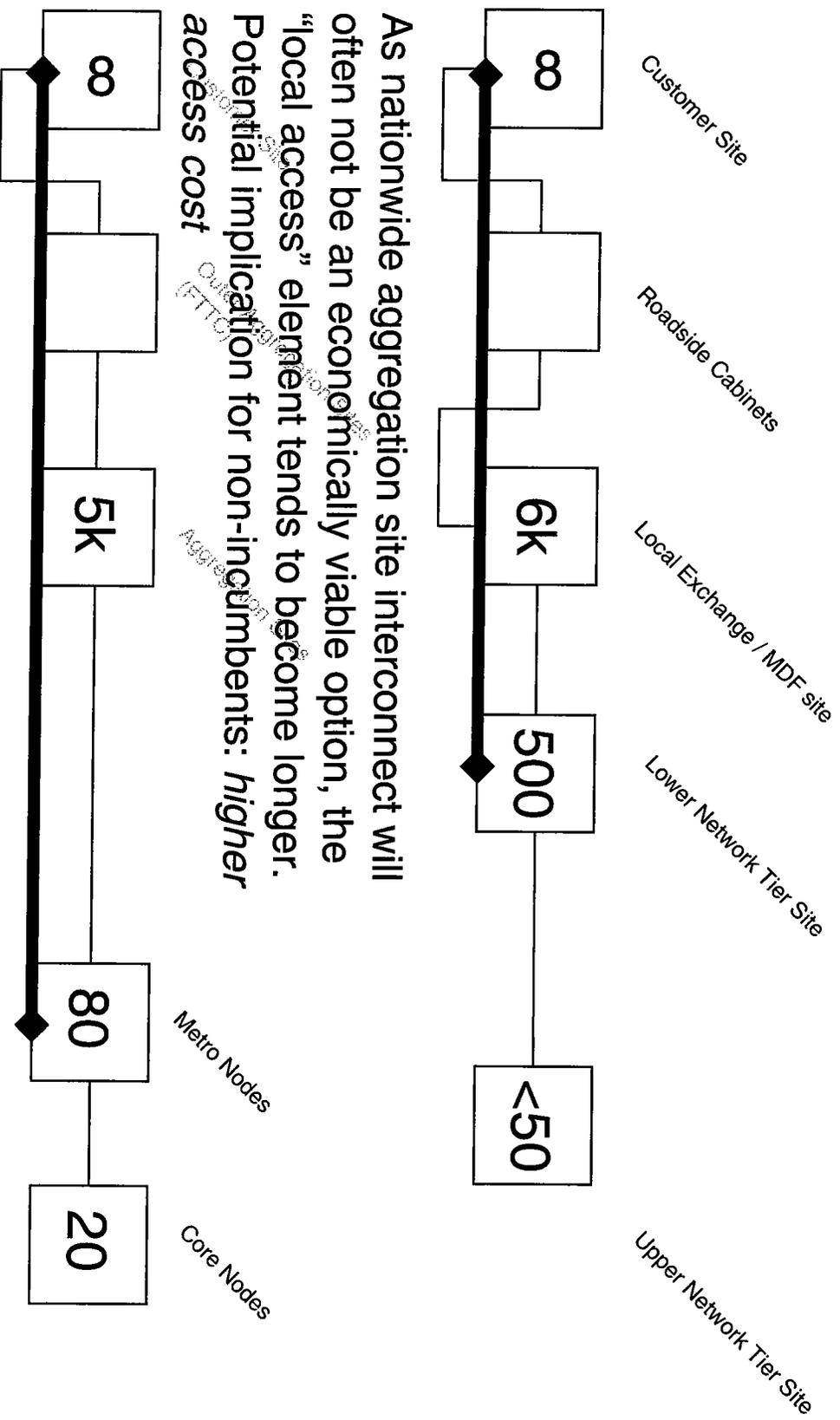
*) Typical figures - for illustrative purposes only.



Issue #1: The gap widens



Issue #2: "local" circuit lengths increase

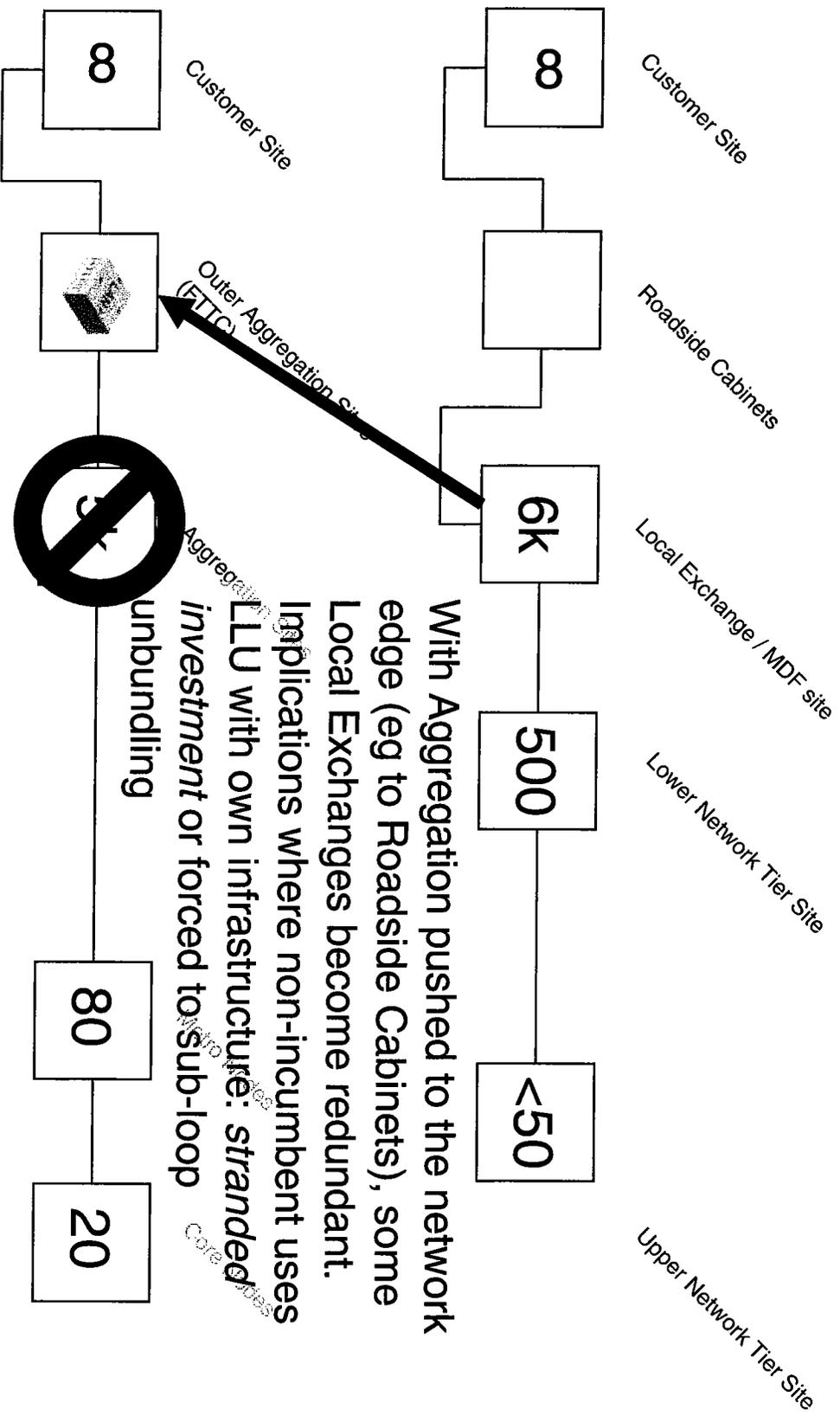


As nationwide aggregation site interconnect will often not be an economically viable option, the "local access" element tends to become longer. Potential implication for non-incumbents: *higher access cost*

Example: Netherlands: currently 461 local PSTN nodes, 1300 MDFs, future: 28 backbone nodes, 193 MDFs



Issue #3: Local Exchanges vanish



Example: Netherlands: currently 1300 MDFs, future: 193 MDFs

Issue #1: The future of termination charges – Calling Party Pays (1)

- **Starting point:** Calling party pays, i.e. the calling end user pays the retail charge to the originating provider of his choice, and the originating provider pays a wholesale termination charge to the operator who has the called customer on his network
 - CPP has always been criticized as facilitating monopoly gains, as third parties (callers) are obliged to pay the cost of the network operator chosen by the customer
 - CPP has also been criticized as encouraging inefficient behavior, as a cost-regulated operator may be inclined to stay with his old PSTN rather than to invest into a more cost-effective network as termination charge is higher
- **New problem:** In an all-IP world, voice is an application, so VoIP providers can terminate calls to customers physically connected to a different network operator. The network operator bears the cost (which sits in the physical customer connection) – but the VoIP provider receives the termination charge
- **Solutions?**
 - Leave this as it is – it is the network providers fault if he cross-subsidises
 - Move to a Called-Party Pays (Bill & Keep) regime
 - Set different termination charges for VoNGN and Vol termination

Issue #1: The future of termination charges – Bill & Keep (2)

- **Starting point:** Each operator charges its customers for their connectivity to this common point to make and receive calls, and no money need change hands between operators
- **Advantages:**
 - Reduces the need for interconnect payments
 - Leaves each provider the freedom to realise the value of what they provide to their customer
 - Avoids excessive termination charges
- **But:**
 - Transition to Bill&Keep affects the retail market – cost of incoming calls need to be covered by end user, i.e. mobile customers would pay more than at present, fixed customers would pay less. This is a fundamental change: Retail customers would bear the full cost of their chosen medium
 - At wholesale level, Bill and Keep is only fair where incoming and outgoing traffic are balanced
 - As the unit cost in less densely populated areas are higher, retail customers in these areas might have to pay more

Issue #2: Transitory costing between old and new world

The problem.

- Implementation of NGN requires a transition period
- It remains open what happens to legacy networks still used by remaining market participants – particularly where Incumbents choose to overlay their NGN instead of substituting it

Implications.

- **Unit cost developments.** During transition period, the operator moving to NGN will run old and new world assets in parallel which will impact his cost base. Vice versa, some market participants may wish to continue usage of old world assets – but as the incumbent does not use the old network any more, unit figures drop – so the unit cost associated with the legacy service increases significantly
- **Double Capex requirements.** While interconnected operators experience the same “parallel operation” phenomenon as the incumbent, they have to cope with investment though being part of a cash-strapped industry – double capex for same service, and the need to write off old world assets once the transition is completed

Why worry about access?

- **Access is the link to the customer:**
 - vital for the provision of any service
 - expensive to recreate
 - differs for business and consumer services
 - typically already exists for the incumbent
 - So should
 - it be made available to market entrants?
 - on what terms?
- **European framework would suggest this is an SMP market susceptible to regulation**
 - as is recognised in most countries in Europe
 - Significant variations in remedies however
 - and even market reviewed not 100% completed
 - **NRA powers re: Functional Separation being considered in 2006 review**

What is Next Generation Access?

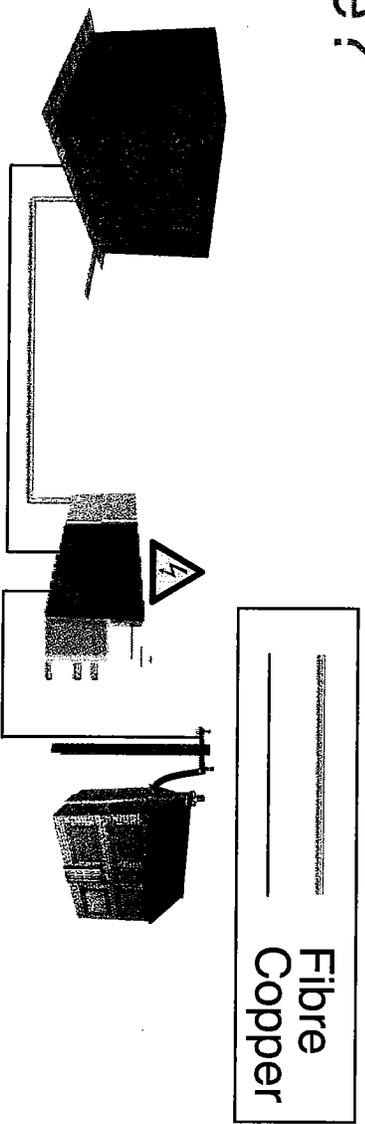
- It is not Next Generation Network
 - The thinking is independent but linked
- How do we move from a tradition layered access delivery:-
 - Copper
 - Radio
 - Coax
 - Fibre
- To provide a single infrastructure to deliver tomorrows media needs
- **Oh ! Don't forget about the business connectivity market!**

Several potential NGA technology options

- wireless?, wireline?

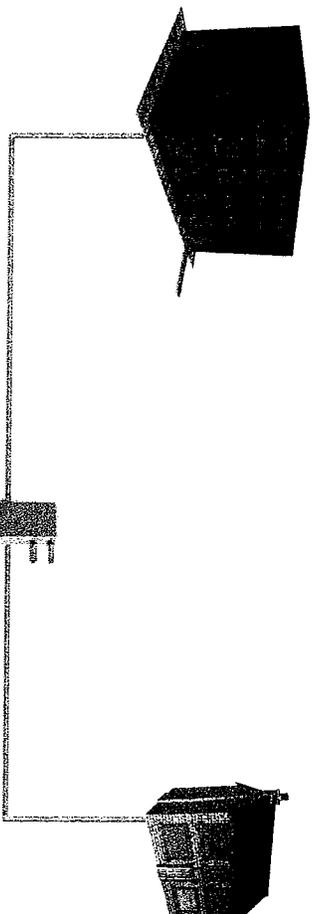
FTTC – e.g.

The fibre connection goes to a powered cabinet in the street. The final connection to the premises is on copper



FTTP – e.g.

The fibre connection goes all the way from the main network to the premises



Where is the enduring economic bottleneck?

Where is the deepest level of sustainable, efficient interconnect viable?

Consider all relevant markets – residential, business, Communications, Broadcast, etc.

FTTP will not support LLU options



Some key points – We all need to consider

- What service/ market is going to drive demand?
 - Media – RTTV (all consumer)
- What other technologies are cost effective?
- What is the economic rationale for investment?
 - Incumbent vs. Entrant
- Different sector requirements/opportunities
 - Business customers
- Sources of funding?
 - Possibilities of public sector?
 - Where is market failure?
- BTs Obligations
 - Universal Service
 - SMP Services
- FTTP could foreclose the LLU market – Risk or opportunity for case

Emerging access strategy – BT's Public position

- From 2008 we will provide networks based on fibre to the premises (FTTP) for major greenfield housing developments, and businesses in such locations. GPON is the currently preferred design option, but we are not yet at a stage to specify the wholesale and retail services which may be provided, or the prices which will be charged
- We remain open to new ideas and funding models to enable broader deployment (eg public sector investment)
- We will bid for Regional Development Agency and other authority projects with public funding for 'brownfield' access infrastructure upgrades using FTTC on an overlay basis, where these are consistent with state aid principles
- Where BT builds fibre access networks for its own use it will make available equivalent wholesale services. BT does not seek a regulatory "holiday"

Emerging access strategy – BT's Public position

- BT supplies high bandwidth fibre today. Most large businesses are fibre connected. But there is **no** significant mass market demand at present retail price points. There are at present **no** mass market demand for bandwidths in excess of those supplied today or available shortly over copper
- We may also supply private fibre networks for residential developments, subject to some conditions being met
- For consumers, high definition television may be a future driver for higher bandwidths but hybrid technologies (satellite, freeview) are much more economic for broadcast. **No** revenue model has yet emerged for recovering the costs of fibre through charging for HDTV services
- Nonetheless we are ready to invest in new fibre based services where an economic rationale exists

21CN – Transparency throughout the process



- Engagement with the regulator was key. Transparency and non-foreclosure were key elements
- Entire section of Undertakings dedicated to NGN
- Ofcom wanted to assure BT worked in good faith with other communications providers and not foreclose design decisions without consultation



- BT wholesale customers were invited to understand, question and input into our 21CN plans
- It's the largest voluntary consultation of its kind ever undertaken in our industry with around 650 people from across industry actively involved
- Launched Summer 2004, with the public announcement of 21CN
- Director recruited from industry
- Each Work Group has BT and Industry Co-Chairs
- Industry Steering Board (Ofcom monitors)
- All proceedings published on the Internet

21CN – Working with stakeholders



- Interconnectivity
- Important to engage the entire industry in the process of migrating to 21CN
- Not just through Consult21, but also to engage national and international standards bodies
- Need global standards for interconnection and interworking to ensure maximum benefits for the end customers



Government

- BT's network is the key national communications infrastructure for the UK
- Government stakeholders recognise that 21CN is good for the UK. Advanced communications networks provide the heartbeat for any modern society, and for any advanced economy

Why Are We Consulting?

REASON 1 To deliver on BT's regulatory commitments

REASON 2 To minimise Implementation risks caused by external factors

REASON 3 To maximise the benefit of 21CN: To deliver a great network with profitable products and very satisfied customers

Consult21 Objectives:

- Ensure industry is aware of the 21CN vision and BT's progress towards it
- Achieve a shared understanding with industry on 21CN
- Ensure industry has an opportunity to input to 21CN development

Consult21 only consults on:

- System & process interfaces
- Obligatory products: transitioning, new, and the testing
- The application of standards architecture
- Operational Implementation plans
- Migration communications

Results of consultation

- We must and should consult
- Engagement has evolved
- Attitudes have improved
- Regulation is still a big influencer
- 21CN still presents challenges for us
- Consultation must continue to evolve
- So far, this has delivered...

UK 21CN – delivery of next generation broadband

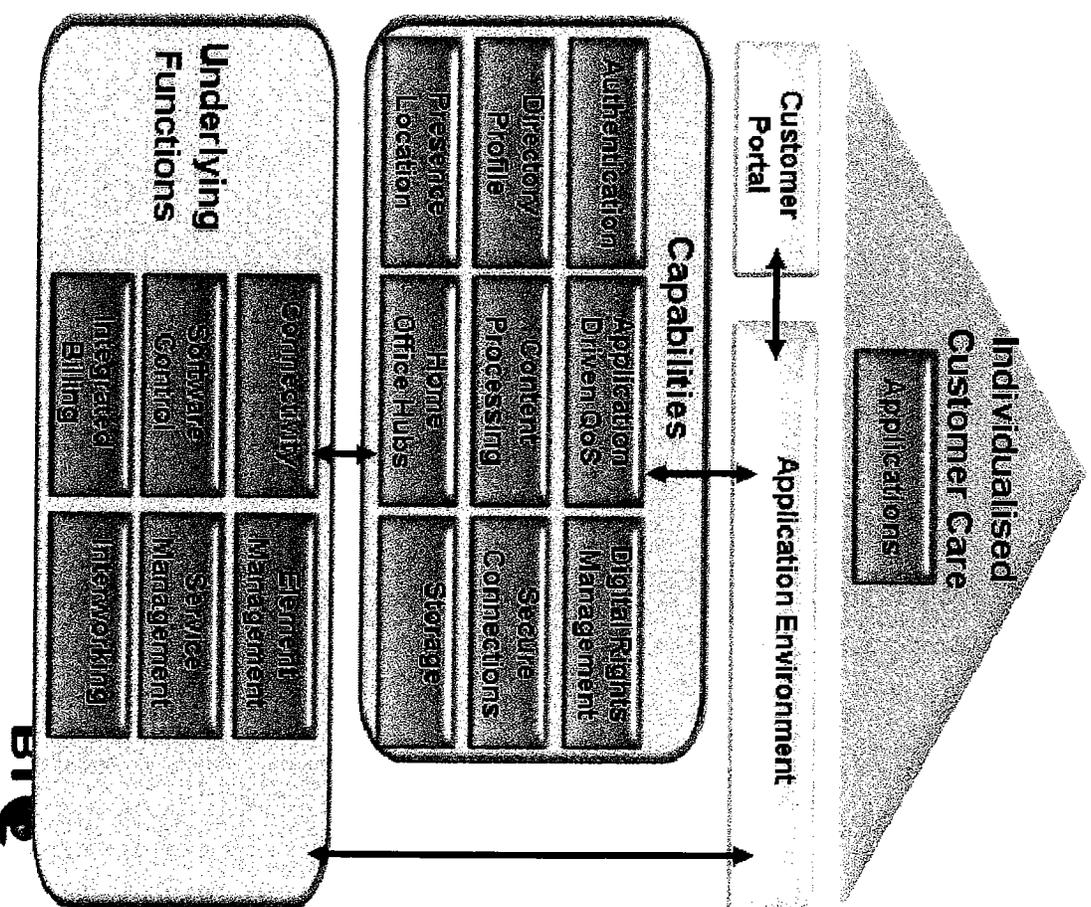
- The UK has higher broadband penetration than USA and leads broadband availability across G8 countries
 - About 50% of UK households receive broadband (~25 mil households in the UK of which 3 mil have cable broadband lines and ~ 9.5 mil have DSL lines)
- BT is delivering the highest stable speed; a line will sustain up to 8Mbit/s (ADSL). 99.8% of households are in ADSL-enabled exchanges
- 21CN will underpin higher speeds - up to 24Mbit/s broadband services across the UK
- ADSL2+ BT Wholesale broadband service is scheduled to be available to around half the UK from early 2008
- This BT Wholesale service will underpin service provider choice
- All of this without regulatory holidays or in exchange for forbearance



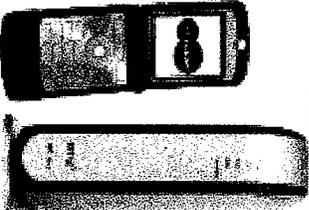
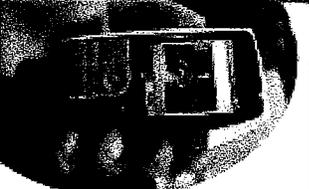
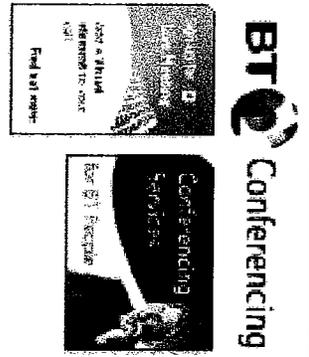
Common capabilities

By March 2007...

- 6-8m customers using broadband products built with capabilities
 - >1m customers using the voice family
- Experiences...
- The business case
 - Intercept with product launch, without slowing launch plans
 - Skilled people and agile process, not just engineering



BT 210CN Compliant Products

 <p>BT Openzone</p>	 <p>BT Vision</p>
<p>BT Communicator</p> 	<p>Fusion</p> 
<p>Applications Awareness Infrastructure</p> 	<p>Movio</p>  <p>BT Conferencing</p> 

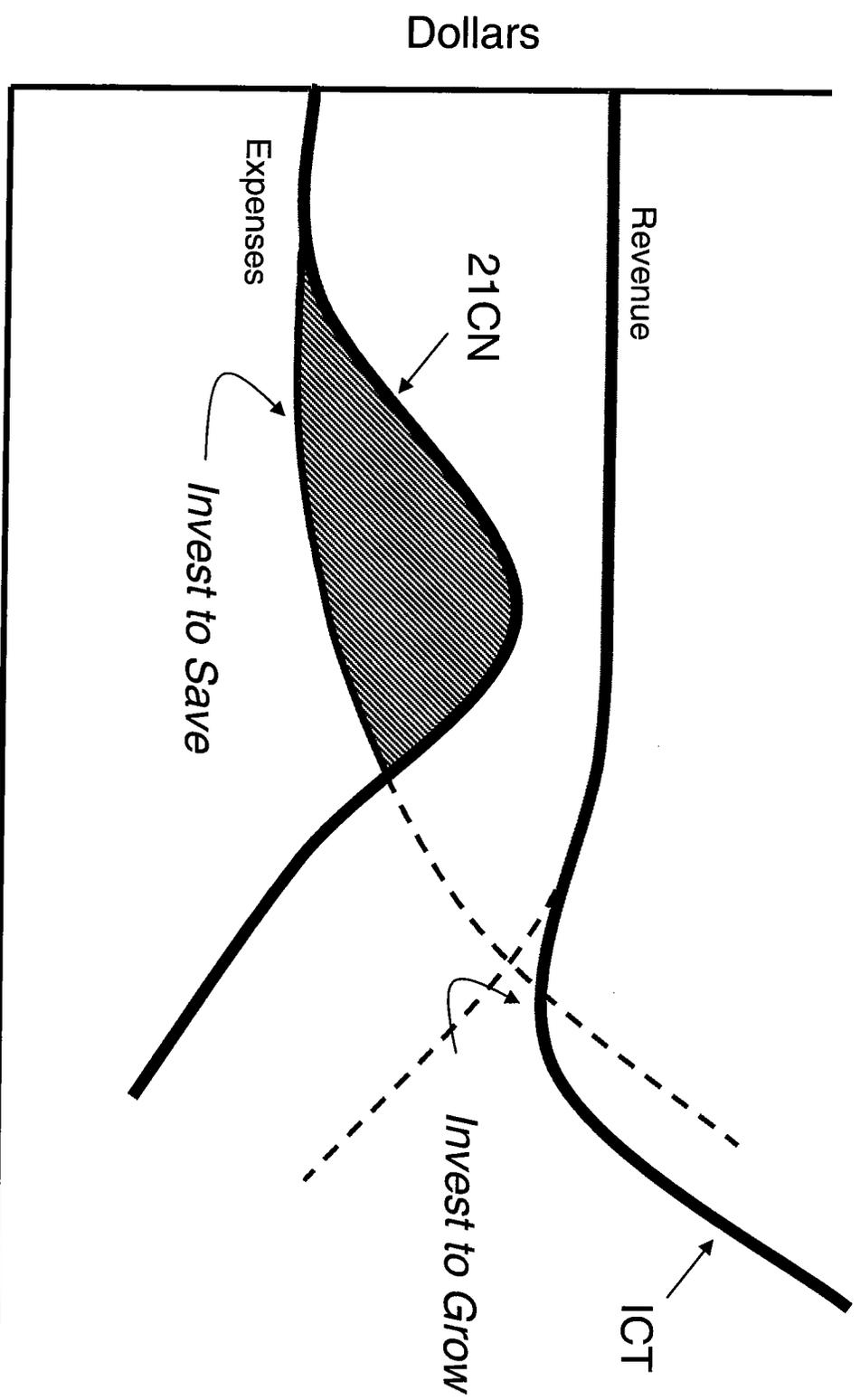
21CN - An opportunity



- BT believes 21CN investment will create significant opportunities
 - 21CN is inclusive, not an exclusive programme
 - helps to attract and retain inward investment
 - creates an investment anchor that will help attract other high value investment and research & development
 - makes businesses more flexible and competitive, regionally nationally and internationally
- 21CN will underpin key priorities to further economic development by
 - driving the digital network economy and growth of ICT
 - enabling the knowledge-based economy
 - enabling growth, stimulating innovation
- 21CN - advanced communications are critical for stimulating the economy and helping others compete on a regional, national and international stage

What's Driving NGN Transformation?

The Need for a Better Cost Structure



Connecting NGNs



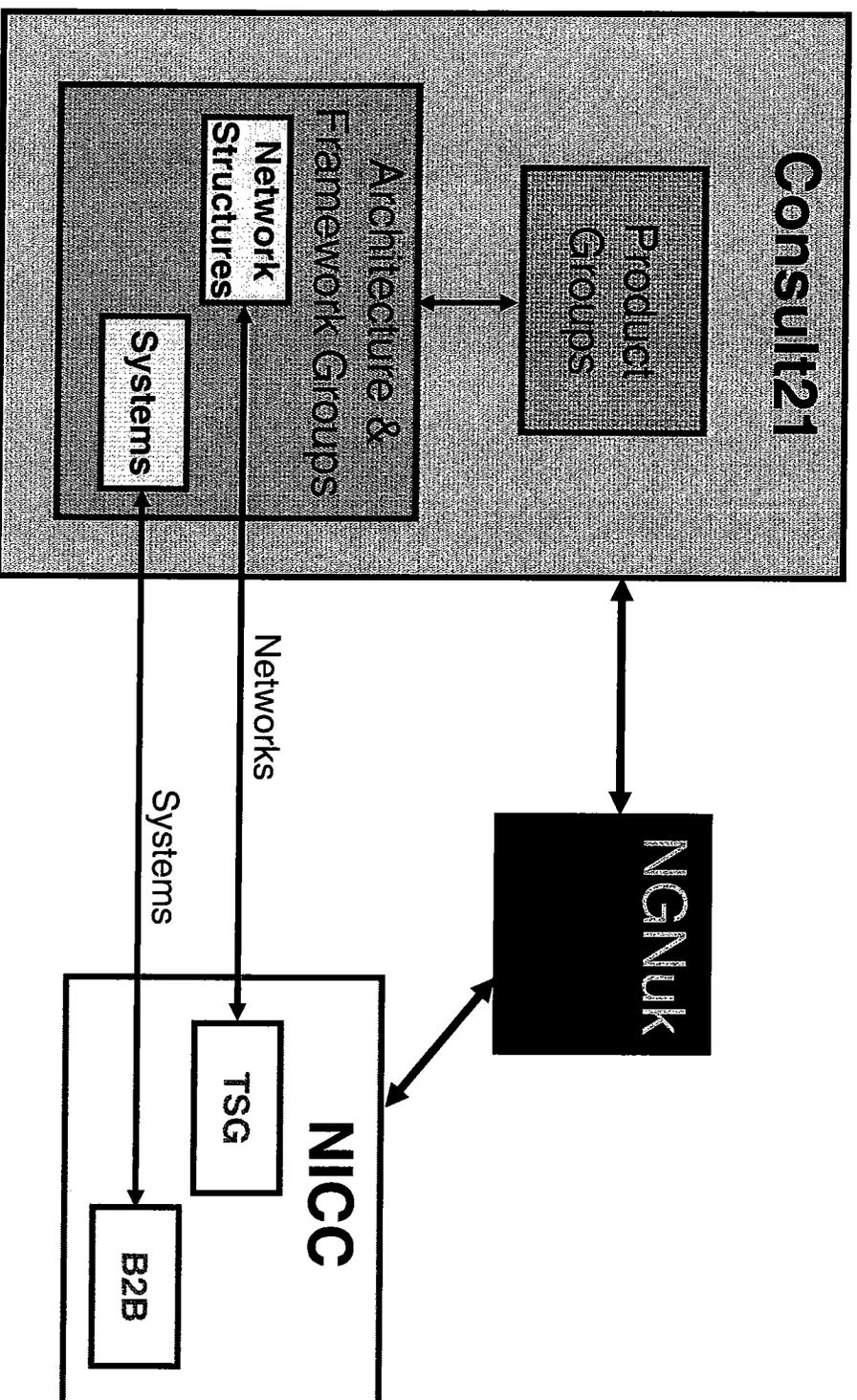
– cross-industry consultation

- Initiated by Ofcom in 2006
- Industry led group
- Reference
 - Standards
 - Services
 - Operability
- Pure IP Interconnection move from ex-ante regulatory to commercial arrangements

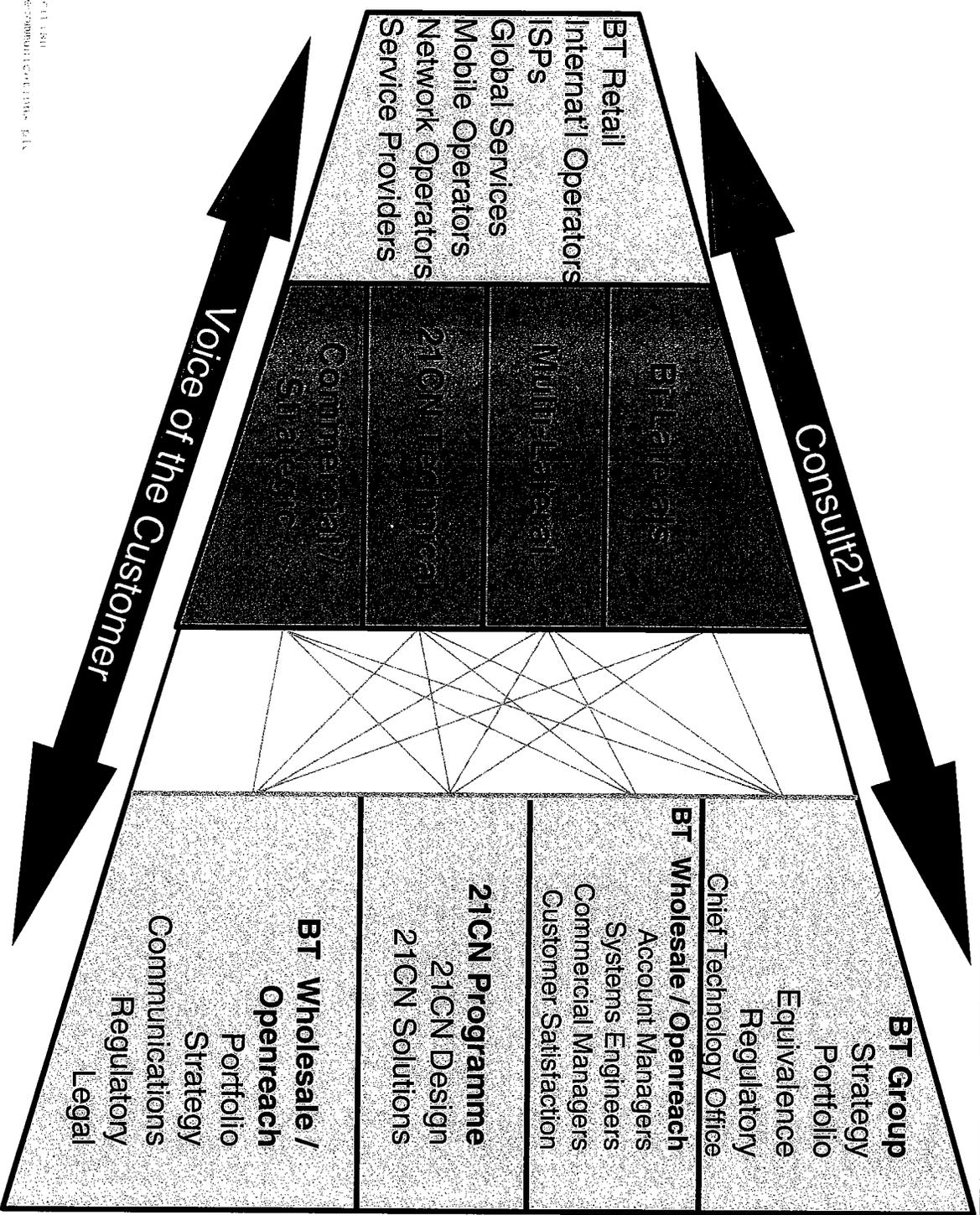
BT is transforming their UK network openly

– with transparent industry-wide debate

Consult21 – External Relationships



Consultation Inter-Relationships





UK Broadband



Sheba Chacko

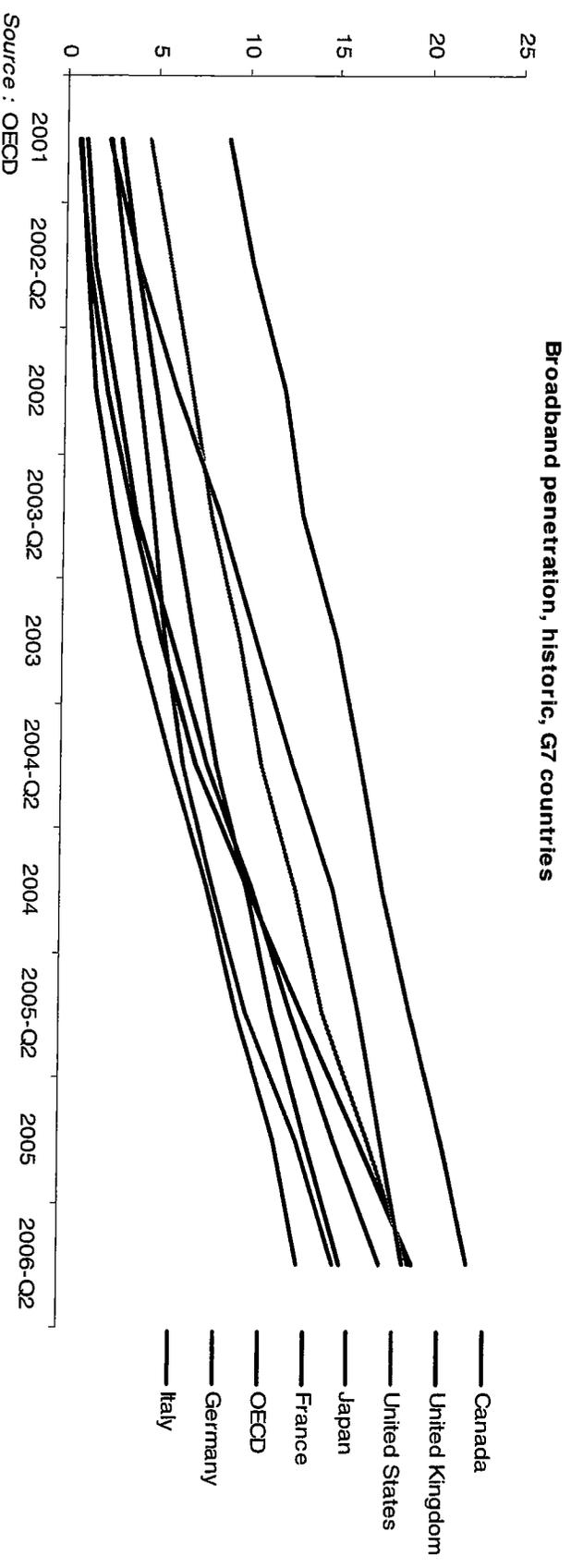
Head, Global Operational Regulation and Americas Regulation

Washington DC April 2007



UK Broadband: Penetration

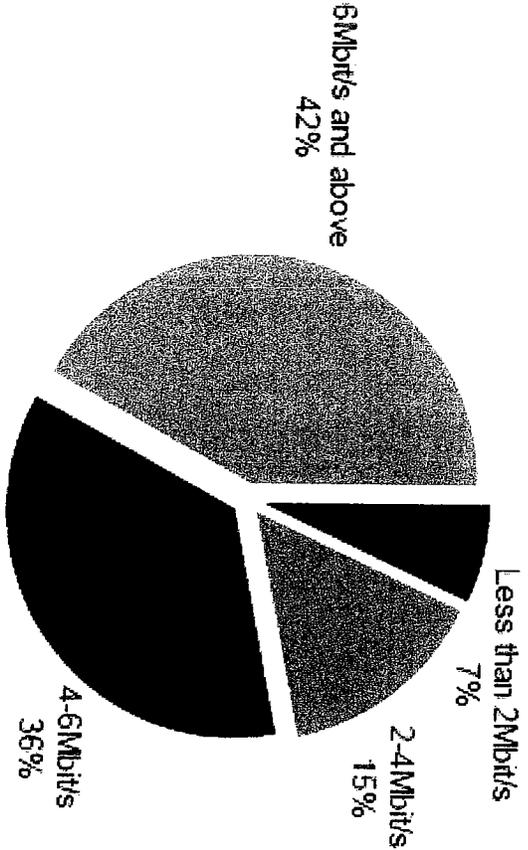
- UK has bypassed the USA in broadband penetration. Half of UK households have broadband ~25 mil UK households of which 3 mil have cable and ~9.5 mil have DSL. Small and medium enterprises purchase another 1 million DSL lines.



UK Broadband: Speed

- 99.6% of UK exchanges have been enabled with 8 Mbps ADSL service
- 24 Mbps (ADSL2+) is being rolled out in 2008
- Average speed of broadband service is 3.8 Mbps (See Ofcom's 2007 Broadband Report at http://www.ofcom.org.uk/research/cm/broadband_rpt/broadband_rpt.pdf)

Figure 29: BT lines by ability to support specific download speeds



UK Broadband: Packages and Pricing

- BT sells consumer broadband service of up to 8 Mbps for as little as \$21/month for the first 3 months and \$29/month thereafter. Includes 250 free wi-fi minutes. (UK prices converted using OECD's 2006 UK/US purchasing power parities rate of 1.62)
- Compare to AT&T and Verizon pricing below

Consumer	Speed	Price in USD
AT&T DSL	Up to 3 Mbps	\$29.95/mt for 12 mts
Verizon DSL	Up to 3 Mbps	\$19.99/mt for first 6 mts. \$29.99/mt for mts 7-12
Verizon FIOS	Up to 5 Mbps	\$29.99/mt for first 6 mts. \$39.99/mt for mts 7-12

UK Broadband: Packages and Pricing

Figure 10: Sample standalone broadband offers from major providers, March 2007

Operator	Broadband service	Headline speed	Download allowance	Connect on /Activati on	Monthly charge	Annual charge	Discount	Total annual cost
Tesco	1Mb BB	1Mb	8GB		£17.97	£216		£216
Tesco	1Mb BB Unlimited	1Mb	Unlimited		£19.97	£240		£240
AOL	Saver	2Mb	Unlimited		£14.99	£180	-£14.99	£165
Tiscali	2Mb Broadband	2Mb	Unlimited		£14.00	£180		£180
Virgin Media	Broadband Size M	2Mb	Unlimited	£25	£16.00	£216	-£46.12	£195
Tesco	2Mb BB	2Mb	10GB		£19.97	£240		£240
Tesco	Tesco Finest	2Mb	Unlimited		£24.97	£300		£300
Virgin Media	Broadband Size: L	4Mb	Unlimited		£25.00	£300	-£10.00	£290
Pipex	Mini	8Mb	2GB		£14.99	£180		£180
Plus.net	BB PAYG	8Mb	2GB	£72	£14.99	£180	-£72.00	£180
Plus.net	Broadband Plus	8Mb	4GB(pk)	£72	£14.99	£180	-£72.00	£180
Plus.net	BB PAYG Basic	8Mb	450Mb	£72	£9.99	£120		£192
BT	BB Option 1	8Mb	5GB		£17.99	£216	-£15.00	£201
Tiscali	8Mb Broadband	8Mb	Unlimited		£17.99	£216		£216
Toucan	8Mb	8Mb	Unlimited		£17.99	£216		£216
Pipex	Midi	8Mb	15GB		£19.99	£240		£240
Orange	Unlimited	8Mb	Unlimited		£19.99	£240		£240
BT	BB Option 2	8Mb	8GB		£22.99	£276	-£24.00	£252
Plus.net	Broadband Premier	8Mb	20GB (pk)	£72	£21.99	£264	-£72.00	£264
Pipex	Max	8Mb	Unlimited		£24.99	£300		£300
BT	BB Option 3	8Mb	Unlimited		£26.99	£324	-£12.00	£312
AOL	Platinum	8Mb	Unlimited		£29.99	£360	-£29.99	£330
TaskTalk	Broadband	8Mb	40GB		£35.00	£420		£420
Virgin Media	Broadband Size: ...	10Mb	Unlimited	£25.00	£35.00	£420	-£10.00	£435
Be	Be line	24Mb	4GB	£24.00	£14.00	£168		£192
Be	Be Unlimited	24Mb	Unlimited	£24.00	£24.00	£288		£312

Source: Pure Pricing UK Broadband, Bundling and Convergence Update, March 2007
 Note: only packages of up to 12 months minimum term are included; discounts assume online ordering

http://www.ofcom.org.uk/research/cm/broadband_rpt/broadband_rpt.pdf

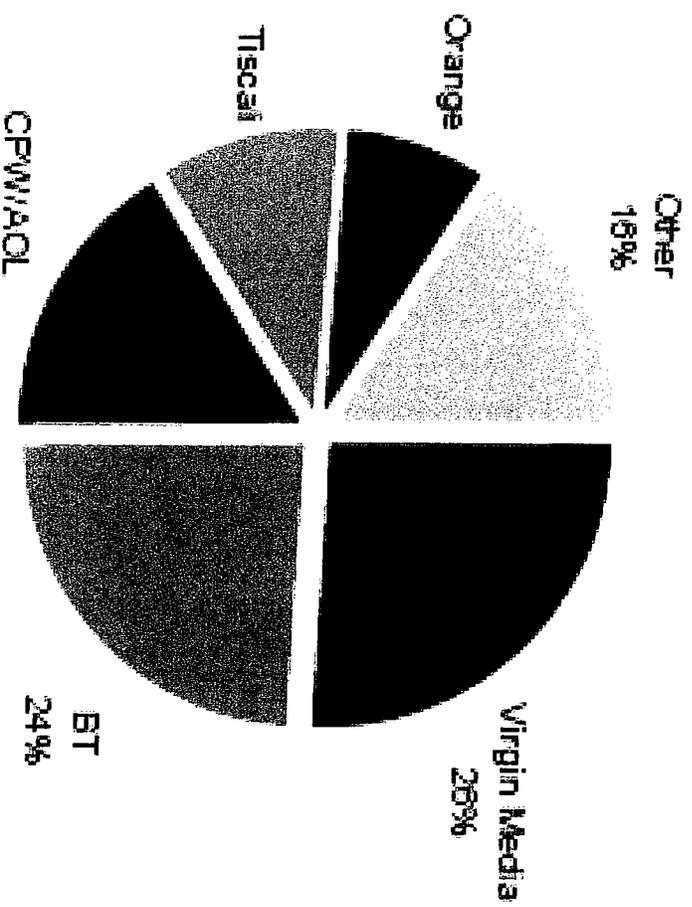


UK Broadband: Competitiveness

- UK has an extremely competitive retail broadband market. Hence the net neutrality debate in the UK has been muted.
- 45% of premises have a choice of technologies -- cable or DSL
- BT has 24% of the residential broadband customers in the UK
- Virgin Media which provides mostly cable-based broadband has 26% of the customers
- Other competitors have 50% of the broadband end customers.
 - They provide broadband using unbundled loops purchased from BT or by reselling various flavors of BT's DSL product

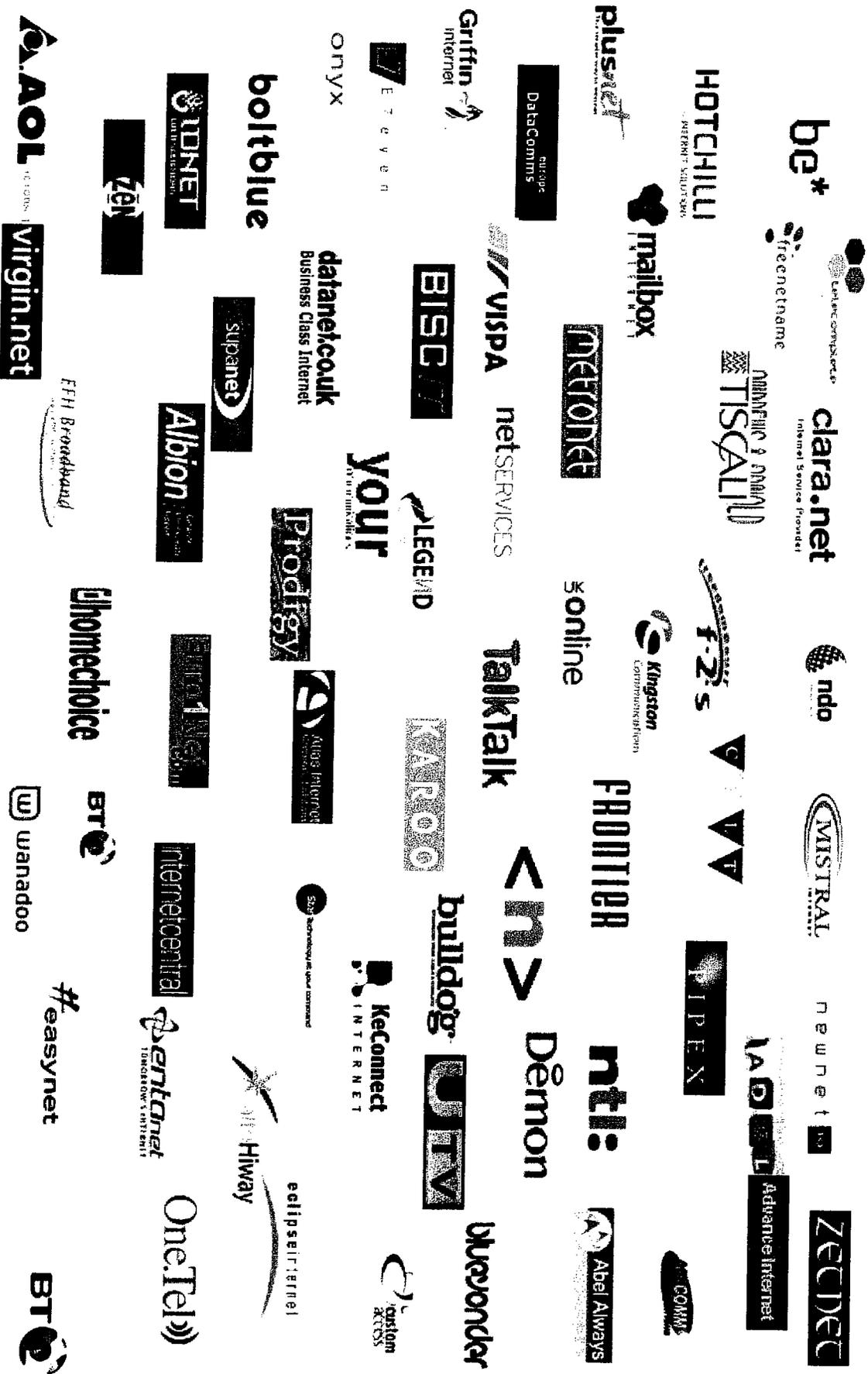
UK Broadband: Competitiveness

Figure 5: Estimated ISP market shares, Q4 2006



Source: Ofcom

UK Broadband: Vibrant Retail Competition



UK Special Access



Sheba Chacko

Head, Global Operational Regulation and Americas Regulation



UK Special Access

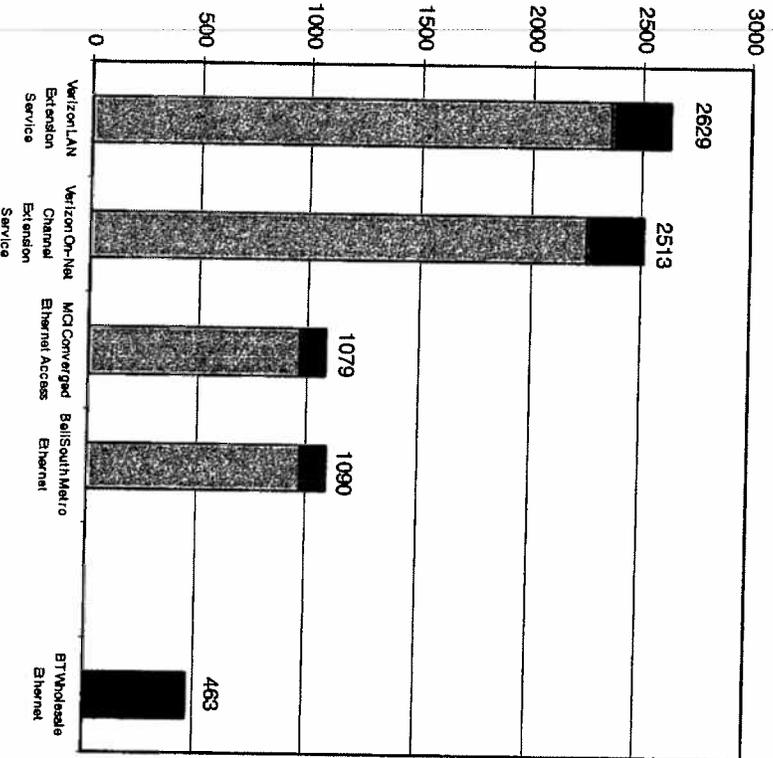
- The UK like the USA has little competition in last mile enterprise access. However, the UK unlike the USA has stringent wholesale enterprise access regulation.
- As a result the flavors of wholesale enterprise access in the UK are cheaper, more varied and more widely available.
 - UK businesses use DSL widely. 65% of UK small and medium enterprises use DSL access of up to 8Mbps.
 - Wholesalers can obtain cheaper Ethernet access than in the USA in addition to TDM-based special access of 1, 2 and 45 Mbps speeds

Wholesale Ethernet

- BT's wholesale Ethernet access and backhaul services are widely available in the UK
- A comparison of BT openreach's 10 Mbps wholesale Ethernet access service (WES 10) to Verizon's and Bellsouth's 10 Mbps Ethernet access service shows that BT's service costs a quarter to a half of the prices charged by Verizon ILEC, Verizon Business and BellSouth
- BT's WES 10 is available for \$463/month and covers a wider area -
 - a radius of 15 miles -- than BellSouth's or Verizon's offering which is limited to a radius of 10 miles
- BT openreach also offers wholesale backhaul Ethernet services at competitive rates

Price Comparison of a 10 Mbps Wholesale Ethernet Access Circuit

Ethernet Pricing (Data as of March 2007)



■ BT Rate - No Explicit USF Charge to End Users in UK
 ■ Explicit US Fed USF of 11.7%
 ■ Ethernet Pricing

Assumptions: Less than 10 miles interoffice. Less than 1 mile channel terminations at each end. 5 year term rates.
 BT's UK prices converted using OECD's 2006 US/UK Purchasing Power Parities Rate of 1.62. PPPs are more representative of the purchasing power of different currencies in their home countries for a given basket of goods and hence the OECD uses PPPs in its telecoms rate comparisons across countries.

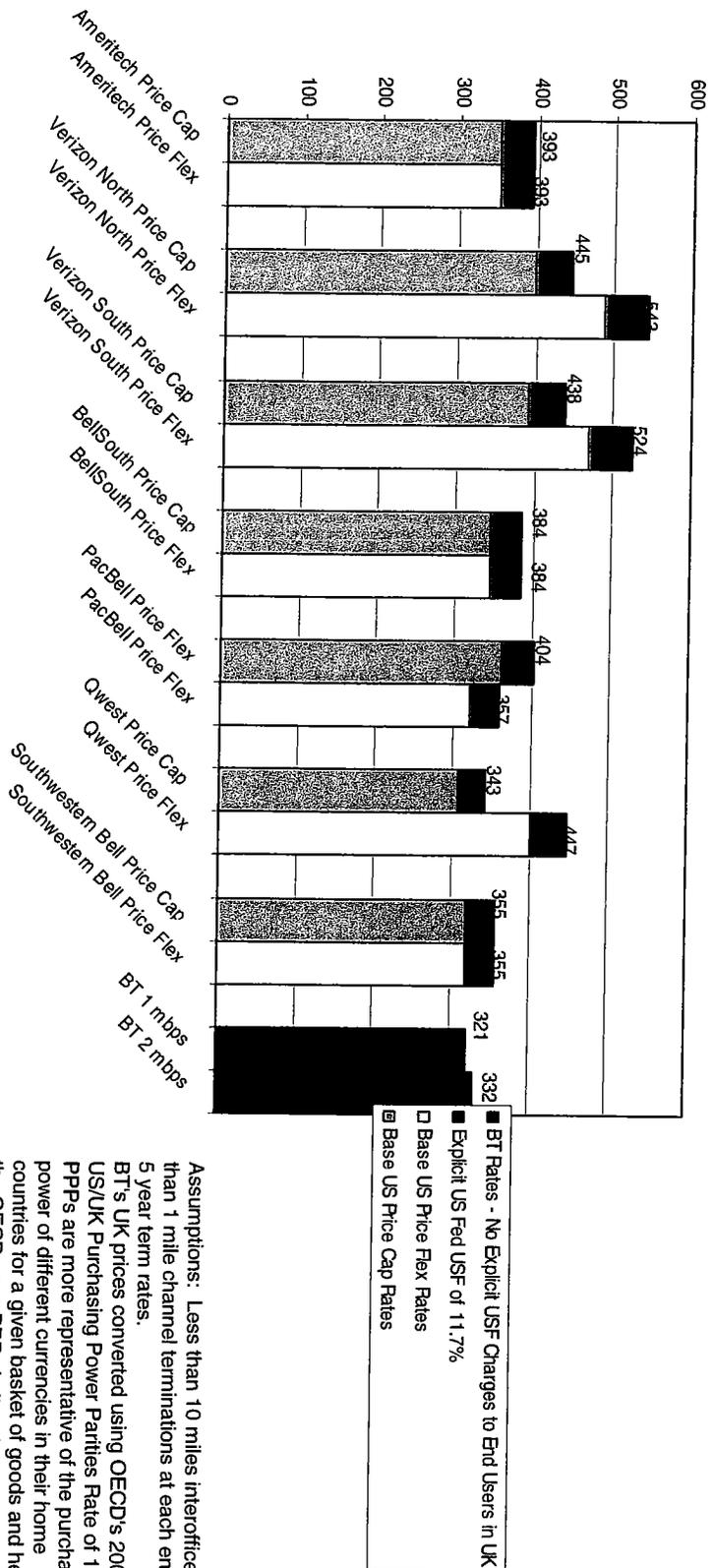


Price Comparisons of TDM-based Special Access Circuits

- BT's TDM-based 1, 2 and 45 Mbps special access circuits ("PPCs") are also cheaper than the US ILECs' equivalents
- BT's PPC rates are price-capped and decrease each year
- BT may not offer term and volume discounts
- BT's PPC rates are standard throughout the UK unlike the Zone 1, 2, 3 variations in pricing contained in ILECs' tariffs
- See the following pricing charts for comparisons of BT's and US ILECs' special access prices
 - N.B. -- Where an ILEC's pricing varied by state, a sample set of states' rates for a particular zone and speed were collected and an average derived. For example, Ameritech's 1.5 Mbps Zone 1 rate is an average of Ameritech Illinois', Indiana's, Wisconsin's, Michigan's and Ohio's Zone 1 1.5 Mbps rates

Price Comparisons of TDM-based Special Access Circuits

US 1.5 Mbps Price Cap and Price Flex Rates (Zone 1)
 Compared to BT's UK 1 Mbps and 2 Mbps Rates
 (Data as of March 2007)

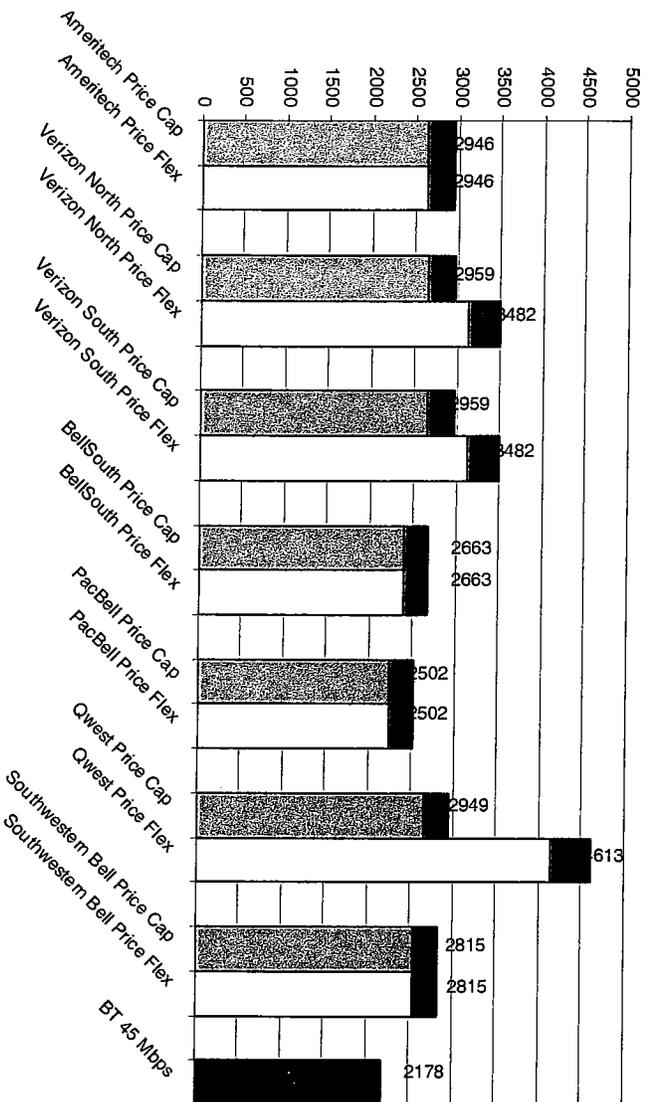


Assumptions: Less than 10 miles interoffice. Less than 1 mile channel terminations at each end. 5 year term rates. BT's UK prices converted using OECD's 2006 US/UK Purchasing Power Parities Rate of 1.62. PPPs are more representative of the purchasing power of different currencies in their home countries for a given basket of goods and hence the OECD uses PPPs in its telecoms rate comparisons across countries.



Price Comparisons of TDM-based Special Access Circuits

US 45 Mbps Price Cap and Price Flex Rates (Zone 3)
 Compared to BT's UK 45 Mbps Rate
 (Data as of March 2007)



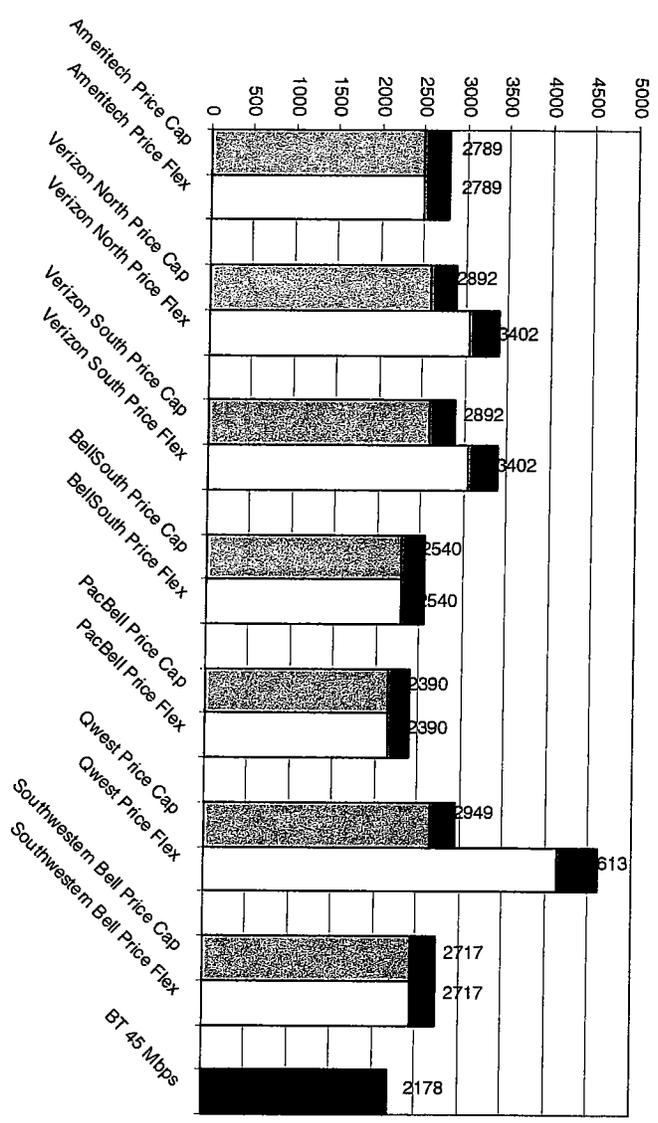
■ BT Rates - No Explicit USF Charge to End Users in UK
 ■ Explicit US Fed USF of 11.7%
 □ Base US Price Flex Rates
 ▨ Base US Price Cap Rates

Assumptions: Less than 10 miles interoffice.
 Less than 1 mile channel terminations at each end.
 5 year term rates.
 BT's UK prices converted using OECD's 2006 US/UK Purchasing Power Parities Rate of 1.62. PPPs are more representative of the purchasing power of different currencies in their home countries for a given basket of goods and hence the OECD uses PPPs in its telecoms rate comparisons across countries.



Price Comparisons of TDM-based Special Access Circuits

US 45 Mbps Price Cap and Price Flex Rates (Zone 2)
 Compared to BT's UK 45 Mbps Rates
 (Data as of March 2007)



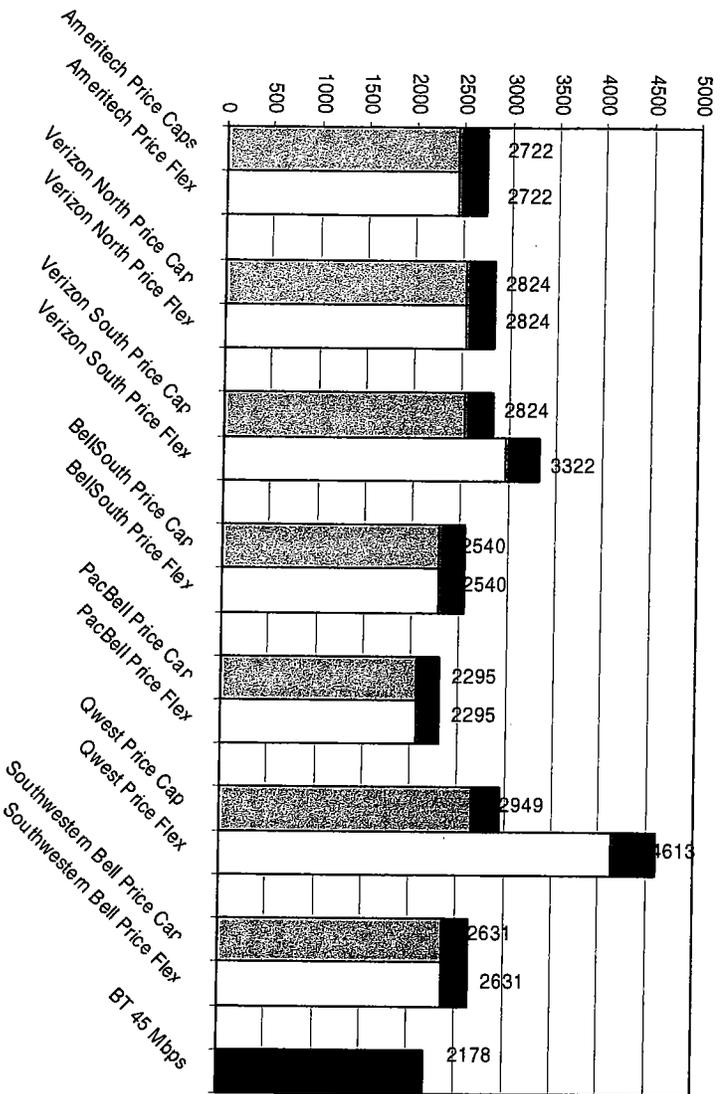
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Price Comparisons of TDM-based Special Access Circuits

US 45 Mbps and Price Cap and Flex Rates (Zone 1)
 Compared to BT's UK 45 Mbps Rate
 (Data as of March 2007)



■ BT Rates - No Explicit USF Charges to End Users in UK
 ■ Explicit US Fed USF of 11.7%
 □ Base US Price Flex Rates
 ▨ Base US Price Cap Rates

Assumptions: Less than 10 miles interoffice. Less than 1 mile channel terminations at each end. 5 year term rates.
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BT 



EC/UK Regulation and Functional Separation

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EC Framework for Communications

- Conceived in July 2003
- Six Directives and one Decision
- National regulators each had to analyze national and local markets to determine whether or not any operators in these markets held significant market power (“smp”) or a dominant position which might give them an unfair advantage vis-à-vis new market entrants.
- Presumption of smp at 28%.
- Applied in a technology neutral manner.
- If market power is found, regulatory authority had to propose an appropriate measure, and if no market power is found, it had to withdraw existing regulation.

New EC Framework for Communications

- 18 markets to be examined in each member state including wholesale broadband, unbundled access, and terminating access and trunks of leased lines.
- Measures to be considered by a regulator include transparency (e.g. publication of a reference offer), nondiscrimination, accounting separation of wholesale and retail activities, access regulation, price controls and cost accounting
- A Member State's failure to implement the directives means legal consequences in the European Court of Justice.

2006 Review of Regulatory Framework for Electronic Communications

1. Framework largely sound and has delivered
2. However, variations in performance require:
 - “Best practice everywhere”: needs consistent application of existing remedies
 - ERG led harmonisation with Commission veto on remedies
 - Prescribed timelines for market reviews
 - NRAs to be independent of government
 - Appeals to be time bound and no suspension of decision
 - Functional separation as additional regulatory remedy
3. Regulation of retail markets should be retained
4. Regulation of mobile markets should be retained
5. No place for “regulatory holidays” - inefficient

On What Terms Should Access be Made Available?

- Non discriminatory
 - Downstream use of access by incumbent should be on same terms as entrants
- Transparent
 - Rules on non-discrimination should be visibly applied
 - Key Performance Indicators
 - Accounting Separation
- Cost orientated
 - Prices should reflect costs, including cost of capital
 - Entrants cannot replicate the economies of scale and reach
 - Foreclosure of the market should be avoided

Ofcom Telecommunications Strategic Review: The issues identified

....competition is restricted in wholesale markets for **access and backhaul services**

- ◆ BT has substantial wholesale market power
- ◆ and is a vertically integrated provider
- ◆ with a presence in the directly related retail markets

This combination gives BT the **ability** and the **incentive to discriminate** against its downstream competitors who are also its wholesale customers

In order to remove the ability and incentive BT and Ofcom agreed undertakings that are additional to SMP regulation.

They came into force 22 September 2005, with rapid implementation

Key elements of BT's Undertakings

- Establishment of “operationally separate” network access business unit: Openreach
- Focus on key access and backhaul bottlenecks
- Provision on an equivalence of inputs (EoI) basis
- Transparency, information sharing constraints and duty of confidentiality
- Clear separation between upstream and downstream divisions: operational separation, systems separation, asset register split and accounting separation
- Independent oversight and enforcement
- Next Generation Networks to be implemented in an “equivalent” manner

Functional Separation: its all about Equivalence

Functional Separation is but ONE regulatory remedy, to be used along with other remedies, NOT to replace those remedies.

Conditions of a Functionally Separate Unit (FSU):

1. Network separation
2. Management separation
3. Restriction on intra company/group influence
4. Reorientation of staff rewards and management incentives
5. Restrictions on where employees can work
6. Restrictions on flow of commercially confidential info
7. Transparent coordination of FSU return on assets
8. Functionally separate unit can not enter retail markets
9. Rest of company can not self supply products of FSU
10. Compliance provisions: KPIs, independent oversight

A New Era of Regulation?

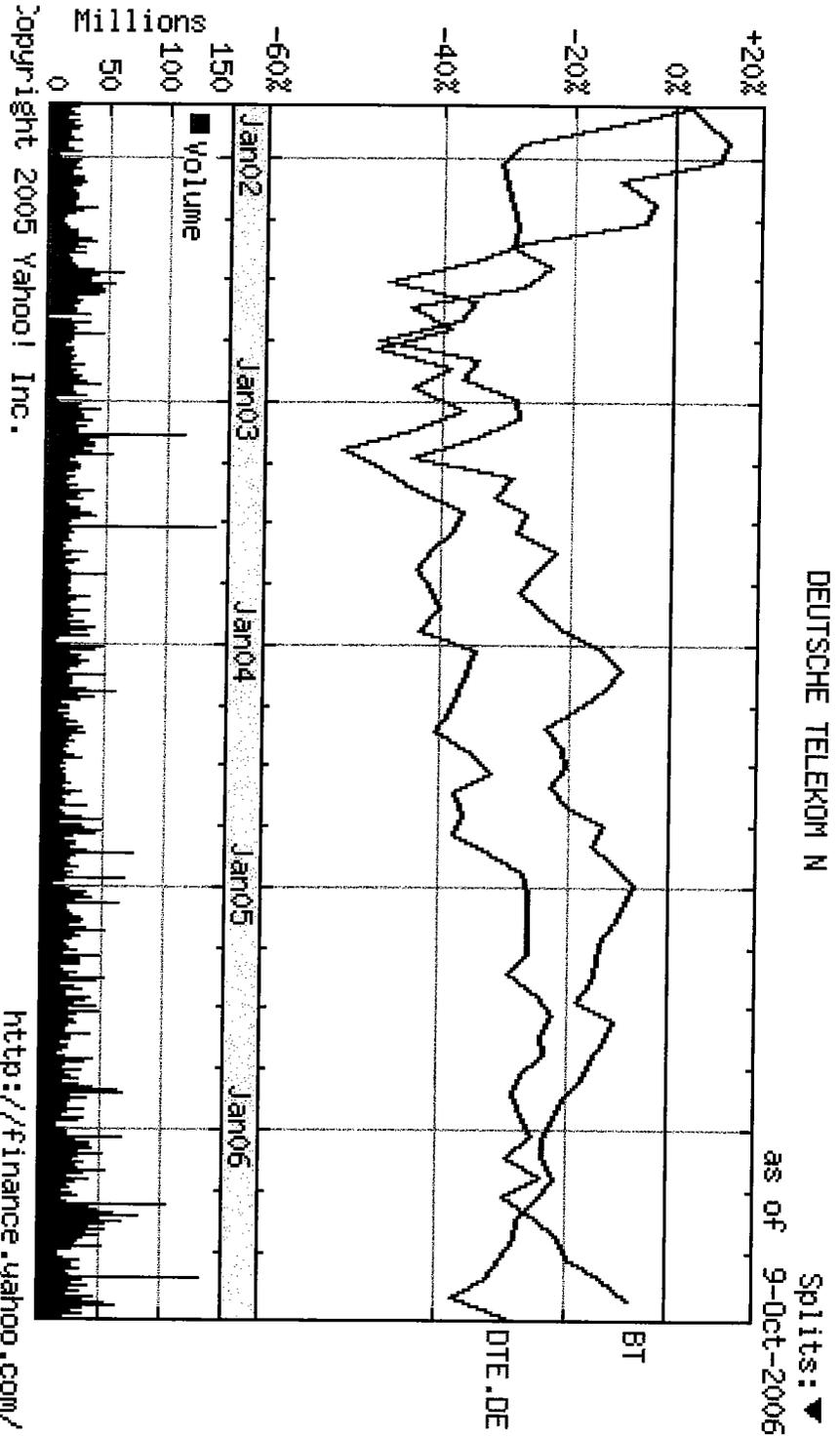
- Increased clarity
- Regulation focused on bottlenecks
- Provided foundation for reduced retail regulation
- Incentive to invest and innovate
- Infrastructure-based competition: benefiting the UK consumer and UK economy

Creating a climate of confidence for infrastructure competition, investment and innovation

Driving Growth in UK Telecoms

- 10m BB connections in the UK (Jan 07)
- 1.5m LLLU lines (over 1m since creation of Openreach) (Feb 07)
- Openreach handles 30,000 LLLU orders per week
- More than 20+ LLLU operators
- Unbundled services provided from more than 1,000 local exchanges

BT Share Performance



- BT share price remained stable over course of negotiations and since Openreach launch
- Openreach did not frighten investment community

Q&A

For more information

About BT's 21 CN

<http://www.btplc.com/21CN>

About BT's Undertakings to Ofcom

<http://www.undertakingsbulletin.com>

Ofcom

<http://www.ofcom.org.uk/telecoms/btundertakings/>

About the EAB

<http://www.btplc.com/Thegroup/Theboard/Boardcommittees/EqualityofAccessBoard/EqualityofAccessBoard.htm>

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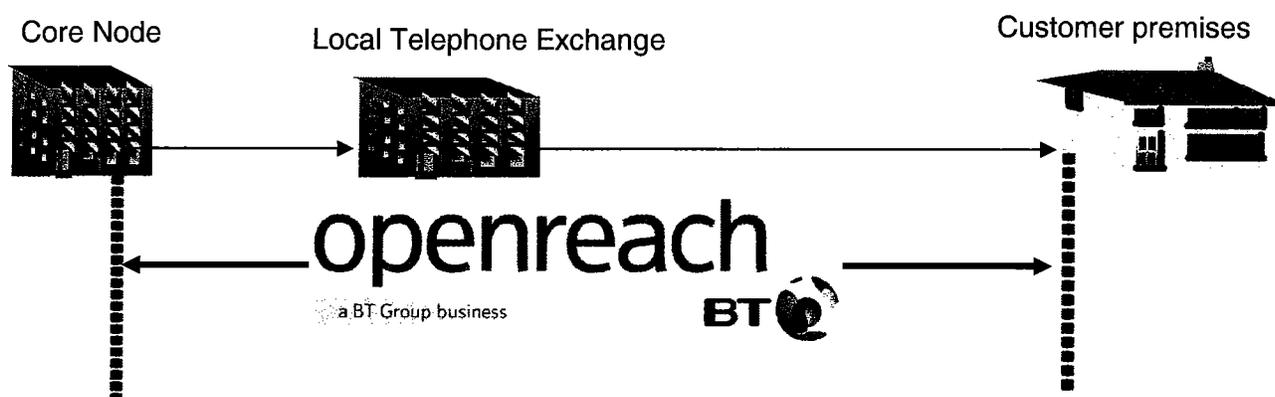
Functional Separation: the UK regulatory model

The Regulatory Challenge:

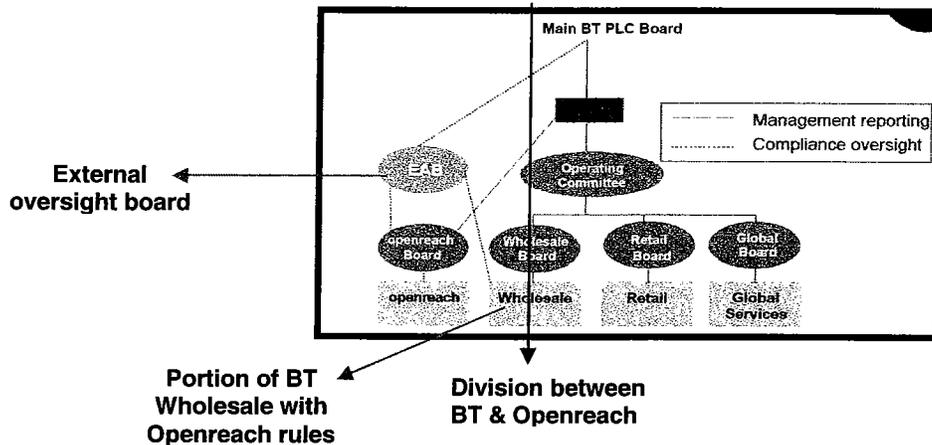
- Electronic communication networks are expensive to duplicate giving rise to enduring bottlenecks
- Competition is especially restricted in wholesale markets for access and backhaul services
- Operators with significant market power (SMP) have substantial wholesale market power and are vertically integrated providers with a significant presence in the directly related retail markets
- Therefore SMP operators have the incentive and opportunity to discriminate on:
 - price
 - services
 - processes
 - information
- Remedies classically include:
 - Non discrimination
 - Cost oriented pricing
 - Cost accounting and Accounting Separation

The Investigation: The UK telecoms regulator, Ofcom, performed a review of the entire telecoms market. In the review Ofcom found that BT, the former monopoly incumbent, had significant market power (SMP) in the last mile access market. Ofcom concluded that because BT owns almost all of the last mile assets BT had the potential to disadvantage the competitive players....**even though** BT already had an extensive series of regulatory pricing and reporting requirements to prevent such behavior.

The Openreach portion of BT's network



The Solution: Ofcom and BT worked in consultation with the competitive telecoms community to craft a solution to the potential market problems. The solution was a re-structuring of BT. All the last mile assets along with any wholesale products where BT had SMP were moved into a new business unit named "Openreach." A lengthy series of structural and behavioral protections were put in place to ensure that BT's consumer and business sales units were treated exactly the same as the other competitive carriers when it came to buying last mile assets from Openreach



The Benefits to BT:

- **Targeted Regulation:** The Openreach model focused Ofcom's regulation on the specific problem areas and reduced the overall number of wholesale and retail regulations. Reducing the overall amount of regulation on BT lessened the administrative burden which was a cost savings to the business.
- **Increased Regulatory Certainty:** The financial markets responded positively to the Openreach announcement with an increase in the stock price. Investors felt more confident in BT now that there was a clear regulatory future for the company.

Benefits to Competitors:

- **Equivalence:** BT and the competitive players are on wholly equal footing. BT not given any advantage by Openreach on pricing or provisioning but is treated in a truly equivalent manner to the competitors.
- **Greater Market Success:** Competitive broadband providers now serve ≈50% of the market. Cable holds ≈ 25% and BT the remaining ≈ 25%.

Benefits to Consumers:

- **Better broadband speeds:** using BT's network competitive providers can offer up to 8Mb services with the future intention of using ADSL2+ which will give up to 24 Mbps.
- **Better prices:** BT maximum speeds have risen from 0.5 to 8Mbps but the increased competition in the market has push prices down from £27.99 to £17.99 per month. (Ofcom reports Dec. '02 to May '06)
- **More Choices:** Competitors have flourished under the Openreach model. There are now close to 400 broadband suppliers providing service using BT wholesale and Openreach products.
- **Quicker release of new technologies:**
 - BT Fusion: combined VoIP/ mobile solution introduced fall 2005.
 - BT Movio: mobile TV product introduced winter 2006.
 - BT Vision: IPTV offering that combines standard broadcast channels with exclusive pay per view content and a DVR. Introduced fall 2006.