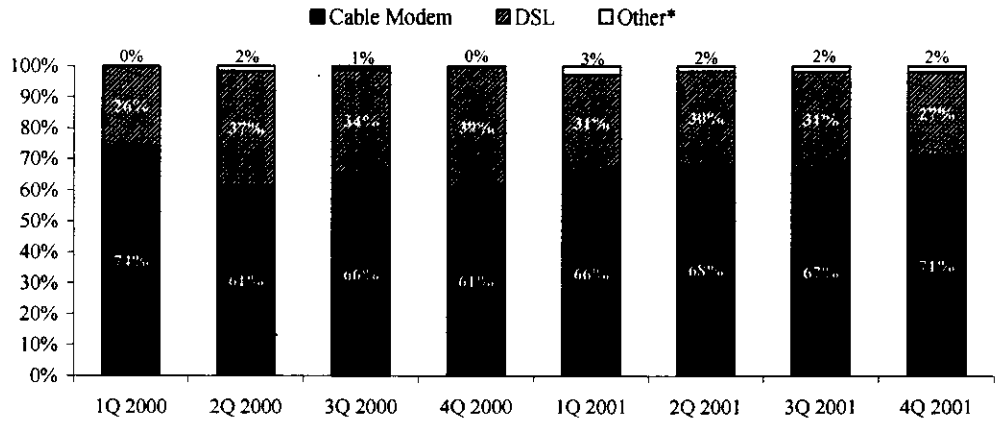
cable modem service is more widely available than DSL.[105] While analysts expect the gap between cable and DSL to narrow somewhat, it is expected that by 2005, cable will still reach 12 to 15 percent more homes than DSL will reach by that time. *See* Table 6.[106]

Figure 7. Market Share of New Residential Broadband Subscribers



*Satellite and fixed wireless.
Sources: Salomon Smith Barney, FCC, Kinetic Strategies, Morgan Stanley Dean Witter, and TeleChoice. *See* Appendix M.

Cable's advantage is that all cable plant is upgradeable; a significant fraction of the existing telephone plant is not. DSL is provided over the existing local telephone network by connecting digital modems over copper loops to the central office, and then ensuring that those loops are free from various electronics (*e.g.*, load coils) that are needed for voice service but that inhibit the provision of data services.[107] DSL service can be provided at high speeds only on loops that are 18,000 feet or shorter,[108] which means that "only about two-thirds of U.S. homes are easily addressable for xDSL."[109] And even with respect to the homes that can be upgraded,

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which finds that, in 2005, 45 percent of high speed subscribers will go with cable and 40 percent will go with DSL.); *TeleChoice Sees Slower But Still Substantial Growth in DSL*, xDSL.com (Aug. 13, 2001), http://www.xdsl.com/content/tcarticles/wp081101.asp.

[105] *See, e.g., JP Morgan Cable Industry Report* at 36 ("Assuming that each platform takes 50% share in markets where both services are available, cable enjoys a more than 2:1 advantage in what each platform's "natural" market share would be, holding all other variables – price, performance, bundling benefits – constant.").

[106] *See, e.g., Yankee Group Critical Mass Report* at Exh. 4 (cable modem service is expected to be available to 83 percent of households by 2005, while DSL service is expected to be available to 74 percent of households.); *Broadband 2001* at Chart 32 (projecting that about 70 percent of households will have both cable modem and DSL service available by 2005).

[107] There are two main variations of DSL: asymmetric (ADSL), which has a higher downstream than upstream transmission rate; and symmetric (SDSL), which offers an equal downstream and upstream rate. ADSL is the most common form of DSL, and is used most often with residential customers, whereas SDSL is used primarily for business customers. *See Second Advanced Services Report* ¶¶ 36-37.

[108] *See, e.g.*, A. Gilroy & L. Kruger, *Broadband Internet Access: Background and Issues*, Congressional Research Service – Policy Papers (May 18, 2001); D. Sweeney, *Ultra Long-Reach DSL : A Whole New Crop of Companies Aims To Boost DSL Performance*, America's Network (Sept. 15, 2001).

[109] *Broadband 2001* at 40.

cable has lower upgrade costs than DSL.[110] This means "that relative to its telco competitors, [cable] has the retail pricing power to under-price competitors while preserving an attractive return."[111]

The two wireless broadband services widely deployed today are broadband provisioned via satellite and terrestrial fixed wireless broadband (MMDS). Broadband satellite services are provided using the same constellation of Direct Broadcast Satellites (DBS) that currently provide video services to more than 17 million subscribers.[112] DBS companies have, in the last year, deployed a two-way high-speed Internet service capable of competing on equal footing with cable modems and digital subscriber lines.[113] The main fixed wireless services provided to residential customers use Multichannel Multipoint Distribution System (MMDS), which uses spectrum in the 2 GHz band.[114] WorldCom and Sprint "own most MMDS spectrum in the United States," and "have commercially deployed MMDS in a handful of markets."[115] WorldCom has recently stepped up efforts to deploy MMDS service, and has begun offering service in four new markets since the beginning of 2002.[116]

Subscribership numbers for broadband satellite remain low: there are an estimated 200,000 subscribers to two-way satellite and fixed wireless broadband services as of year-end 2001.[117] But analysts project that these totals will soon begin to rise rapidly.[118] Whereas

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[110] *See, e.g.*, *Broadband 2001* at 69 ("xDSL starts life at a much higher cost point (close to $800) than cable modem (about $470) primarily because cable makes use of shared head-end terminating equipment, whereas DSL requires dedicated line cards for each subscriber.").

[111] *Bear Stearns Byte Fight! Report* at 82.

[112] *See Eighth Video Competition Report*, App. C at Table C-1; SkyReport, *National DTH Counts: November 2000 – November 2001*, http://www.skyreport.com/dth_us.htm.

[113] *Broadband 2001* at 45 (a "true advantage" satellite data services have over wireline alternatives is "instant near-ubiquity").

[114] *See Broadband 2001* at 131.

[115] *Broadband 2001* at 47. In October 2001, Sprint announced the end of customer acquisition for MMDS services, and a freeze on the number of MMDS markets served "until substantial progress is made on second-generation MMDS technology. The current MMDS customer base will be maintained, as will all video services offered through the fixed wireless spectrum." Sprint Press Release, *Sprint to Terminate ION Efforts* (Oct. 17, 2001).

[116] *See* WorldCom Press Release, *WorldCom Launches New High-Speed, Fixed-Wireless Service in Lafayette* (Feb. 21, 2002); WorldCom Press Release, *WorldCom Launches New High-Speed, Fixed-Wireless Service in Pensacola* (Feb. 20, 2002); WorldCom Press Release, *WorldCom Launches New High-Speed, Fixed-Wireless Service in Springfield* (Jan. 9, 2002); WorldCom Press Release, *WorldCom Launches New High-Speed, Fixed-Wireless Service in Hartford* (Jan. 8, 2002).

[117] *See Yankee Group Fiber and Fixed Wireless Report*; *Echostar Hopes New Plan Will Boost Deal's Chances*, Communications Daily at 3 (Feb. 27, 2002).

[118] *See, e.g.*, *Yankee Group Consumer Broadband Report* at 4 & Exh. 1 ("[S]atellite broadband will reach 300,000 households in the United States by the end of this year and grow to 4.5 million households by the end of 2005 . . . this will translate into a market share jump from 2.81% at the end of 2001, to 14.48% at the end of 2005."); *Broadband 2001* at Table 9 (estimates show satellite market share expanding from 1 percent in 2000 to 10 percent in 2005); Business Communications Company, Inc. Press Release, *Market for Broadband Internet Access Continue to Soar* (Nov. 1, 2001) ("Two-way satellite broadband Internet access will be the fastest growing single-access technology, with expenditures growing at an AAGR of 36.6% from $ 1.14 billion (or 12.8% of all broadband related expenditures) to $ 5.42 billion, or 20.5% of expenditures.").

wireline services generally get rolled out incrementally, wireless services tend to get "turned on" for an entire geographic area in a single step. Wireless, by its nature, generally provides complete geographic coverage in a region – or, in the case of satellite service – the entire country. That wireless providers currently lag behind wireline providers in serving broadband customers reflects the none-to-all dynamic of wireless roll out, more than anything else.

Several companies also plan to offer residential broadband services using unlicensed spectrum bands, including the 2.45 GHz Industrial-Scientific-Medical (ISM) band and the 5.8 GHz Unlicensed National Information Infrastructure (UNII) band.[119] As noted above, WorldCom has recently accelerated its efforts to deploy MMDS service. Customers within "35 miles of a centrally located transmittal tower" can obtain "high-speed broadband Internet access in as little as five to ten days."[120] The Commission's staff found that the "MDS industry has invested several billion dollars to develop the band for fixed wireless data systems," and that "these systems will provide a significant opportunity for further competition with cable and digital subscriber line (DSL) services."[121]

Competitors are supplying last-mile broadband connections to small business customers, as well as residential customers. Cable operators are beginning to extend their cable networks to provide high-capacity loops to serve small and medium-sized business customers. This push is being driven by the advent of next-generation Voice-over-Internet-protocol technology, which has "solved" "previous difficulties such as [Quality of Service] problems, incompatible and incomplete standards, and lack of equipment."[122] Today, "[b]usiness trials of [Fiber to the Business] are underway . . . with deployment expected this spring."[123] Numerous cable operators already have realized that there are many businesses that lie in close proximity to their networks, and that it makes sense to build out their networks incrementally to serve them.[124]

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[119] *See Broadband 2001* at 49 ("A host of small start-ups are deploying some limited services over unlicensed bands, and some larger providers are running unlicensed spectrum trials."); S. Buckley, *MMDS Hits the Airwaves*, Telecommunications Magazine (Feb. 2001) ("IGI Consulting predicts that by 2005, there will be at least 1000 unlicensed wireless ISPs in operation and 1.3 million subscribers. . . . Unlike licensed MMDS holders that are restricted by the FCC's stringent rules, unlicensed carriers such as Clearwire, Fuzion Wireless and PSInet can set up shop immediately.").

[120] WorldCom Press Release, *WorldCom Launches New High-Speed, Fixed Wireless Internet Service in Springfield* (Jan. 9, 2002).

[121] Carroll McHenry, Chairman and CEO, Nucentrix Broadband Networks, *Third Generation Wireless*, remarks before the Senate Subcommittee on Communications, Committee on Commerce, Science and Transportation, Washington, D.C. (July 31, 2001) (citing FCC "Final Report" at 13). Fixed wireless operators offer consumer broadband services which are priced comparatively to terrestrial broadband services, such as cable modems and DSL. *See, e.g.*, E. Tahmincioglu, *For High-Speed Access to the Web, a Dish-to-Dish Route*, N.Y. Times (Oct. 11, 2001) ("The fixed-wireless connection...costs $40 to $60 a month, depending on the provider. Installation and equipment can total around $300 but some companies waive the fees.").

[122] TIA Press Release, *Cable's Fiber to the Business Deployment Spurred by VOIP* (Feb. 14, 2002).

[123] *Id.*

[124] *See, e.g.*, G. Lawyer and C. Wolter, *The Cable Giant Stirs*, Sounding Board Magazine (Dec. 1, 2001), http://www.soundingboardmag.com/articles/1c1vox.html (quoting Geoff Tudor, president and CEO, Advent Networks: "Cox realized there were 300,000 small businesses within 50 feet of their coaxial drops, easily reachable. . . That could greatly expand the network's revenue-generation potential."); C. Weinschenk, *Cable Makes Advances Into CLECs'*

Satellite providers have designed service offerings specifically targeted at small business customers. For example, Hughes offers DirecWay service, which is a "business edition Internet access" service that gives "small business[es] access to the same advanced technology that powers global enterprises."[125] The DirecWay service gives business customers the option of much higher throughput and downstream bandwidth than is available with Hughes's basic consumer offering.[126] WorldCom has announced that it would be reselling Hughes's DirecWay Service to small- and medium-sized business customers beginning in January 2002, and rebranding that service with WorldCom's name.[127]

While the provision of broadband services is undeniably competitive today, the most important competitive opportunity over the longer term centers on the chase for far more bandwidth than existing "broadband" networks currently offer. The upgrading of cable, telephone, and wireless networks will not end in the foreseeable future; appetites for bandwidth continue to grow faster than infrastructure can be built. Cable and telephone companies alike will push fiber deeper and deeper into the local exchange, until it finally reaches the home. Wireless providers will multiply and shrink cells, and boost capacities, to keep pace. Much of this new infrastructure will have little relation to the old. ILECs will accordingly enjoy no particular advantages over competing carriers in deploying this new infrastructure.

Wake, Multichannel News at 18 (Dec. 3, 2001) (Charter likewise has, in addition to over 1,300 small and medium-sized business customers, fiber connections to approximately 400 businesses; these 400 businesses serve approximately 4,200 home workers with VPNs); M. Reilly, *New Cable Modem Target: Businesses*, CityBusiness (May 18, 2001) (Michael Fox, vice president and general manager of Time Warner Cable in Minneapolis, said roughly 50,000 businesses were located within range of the company's cable service area, though one-third of the businesses already signed up needed some sort of network buildout. However, "[i]t made a lot of sense to expand into the business sector.").

[125] DirecWay, *For Small Business*, http://www.hns.com/direcway/for_small_business/learn_more/overview.htm.

[126] There are three service plans for business service: Business Basic (500 MB throughput, up to 400 kbps downstream); Business Plus (800 MB throughput, up to 750 kbps downstream); Business Premium (1000 MB throughput, up to 1000 kbps downstream). DirecWay, *Business Edition Internet Access*, http://www.hns.com/direcway/for_small_business/learn_more/business_edition.htm.

[127] WorldCom's service will be available in 600 kbps, 800 kbps, or 1 Mbps download speeds, with 128 kbps upload speeds. WorldCom's service level agreement with Hughes guarantees an upload speed of 128 kbps. J. Wagner, *WorldCom Is Now Truly Long Distance*, ISP News (Nov. 27, 2001), http://www.internetnews.com/isp-news/article/0,,8_929181,00.html.

V. FACILITIES-BASED COMPETITION VERSUS RESALE

The Commission has affirmed that, "in the long term, the most substantial benefits to consumers will be achieved through facilities-based competition."[1] "Facilities-based competition is the ultimate objective" of the Commission's competition policy."[2] At the same time, however, the Commission has attempted to craft its unbundling regulations to promote the "rapid introduction of competition in all markets."[3] The Commission's other stated objective has been to encourage CLECs "to serve the *greatest number of consumers as rapidly as possible*."[4]

Experience since the 1996 Act establishes that facilities-based competition has evolved largely apart from UNE-based forms of competitive entry – and that regulatory policies focused on promoting the indiscriminate use of UNEs advances the short-term appearance of competition over the long-term substance.

The enormous increase in facilities-based competition over the past six years has had very little to do with the availability or use of UNEs. Competitors have instead relied on facilities-based strategies from the outset. They have grown incrementally, establishing a foothold and then expanding core network facilities step by step into new geographic and product markets. Over time, this strategy has delivered robust competition to very significant numbers of both business and mass-market customers.

Overall, however, the current regulatory structure has favored the rapid proliferation of small, under-funded, technically unsophisticated competitors, over the more measured evolution of robust and durable ones. All too often, it has been easier and cheaper for a CLEC to piggy-back on the incumbent's network permanently rather than build out a network of its own. Such CLECs have attempted to enter local markets very rapidly, on a very large scale, by relying predominantly – and all too often exclusively – on UNEs. The Commission expected these competitors to rely on UNEs only until it "was practical and economically feasible to construct their own networks."[5] But many CLECs have adopted business strategies that center on long-term reliance on UNEs, with no expectation at all of ever building facilities to replace them. A significant number rely on ILEC networks from end-to-end, which they do primarily through the

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[1] *Promotion of Competitive Networks in Local Telecommunications Markets*, Notice of Proposed Rulemaking and Notice of Inquiry in WT Docket No. 99-217 and Third Further Notice of Proposed Rulemaking in CC Docket No. 96-98, 14 FCC Rcd 12673, ¶ 4 (1999); *see also UNE Remand Order* ¶ 110 ("the construction of new local exchange networks" benefits consumers, the Commission has explained, because facilities-based carriers "can exercise greater control over their networks, thereby promoting the availability of new products that differentiate their services in terms of price and quality"); Michael K. Powell, Chairman, FCC, *Digital Broadband Migration – Part II* at 4 (Oct. 23, 2001), http://www.fcc.gov/Speeches/Powell/2001/spmkp109.pdf ("Facilities-based competition is the ultimate objective" of the Commission's competition policy.); *id.* (unbundling policy "should provide incentives for competitors to ultimately offer more of their own facilities").

[2] Michael K. Powell, Chairman, FCC, *Digital Broadband Migration – Part II* at 4 (Oct. 23, 2001), http://www.fcc.gov/Speeches/Powell/2001/spmkp109.pdf.

[3] *UNE Remand Order*, 15 FCC Rcd at 3705.

[4] *Id.*

[5] *Id.* ¶ 6.

effective "resale" of ILEC service that is made possible by the unrestricted availability of the UNE Platform.

Many of the CLECs pursuing UNE-centric strategies have failed. Investors have recognized that these CLECs are engaged in highly speculative ventures of regulatory arbitrage, and offer no true value of their own. The UNE-centric CLECs have harmed their facilities-based counterparts, too. Facilities-based CLECs recognize that the unrestricted availability of UNEs priced at a regulator's estimation of long-term incremental cost can ruin a business making steep capital investments at here-and-now, real-world prices. These facilities-based CLECs view the availability of the full UNE Platform as particularly harmful to facilities based competition. *See* Table 1.

Table 1. CLECs Opposing the Availability of UNE Platforms
Allegiance Telecom, Cablevision Lightpath, Cbeyond Communications, Time Warner Telecom, XO: "[T]he evidence submitted in this proceeding since the *UNE Remand Order* was released confirms that competition is thriving in markets where the requirement to provide unbundled switching has been removed."
Allegiance Telecom: Expanding "the availability of the UNE-P" "threatens to harm those CLECs that have built their own facilities and do not need to rely on the UNE-P to serve customers."
UNE-P pricing levels "could well be too low," which "mak[es] it more difficult for efficient, facilities-based [competitive local exchange carriers] to compete."
"[O]nly carriers that make investments in networks and equipment are able to deliver the product, technology and service innovations that provide competitive alternatives to the ILEC."
Choice One: "Choice One's business experience demonstrates that new entrants can provide service to small business customers . . . without the need to rely on unbundled local switching purchased from an incumbent LEC. . . . We are unaware of any reason why another carrier could not replicate it using unbundled loops and self-deployed switches, even in second and third tier urban markets. The Commission's rules governing unbundled local switching should reflect this fundamental fact."
TCG (pre AT&T merger): The FCC should "ensure that wholesale competition does not drive out or diminish the development of strong, facilities-based competition."
Sources: See Appendix M.

Based on the first comprehensive study of its kind, one of the Commission's own economists recently found that "states with lower UNE prices have less facilities-based entry."[6] Other noted economists, scholars, and jurists have reached the same conclusion: unbundling ultimately undermines facilities-based investment.[7] If an incumbent carrier aggressively sold its

[6] James Eisner, FCC, & Dale Lehman, Fort Lewis College, *Regulatory Behavior and Competitive Entry*, for presentation at the 14th Annual Western Conference Center for Research in Regulated Industries, at 2 (June 28, 2001). According to its authors, this study does not necessarily represent the views of the FCC itself.

[7] *AT&T v. Iowa Utils. Bd.*, 525 U.S. 366, 429 (1999) (Breyer, J., concurring in part and dissenting in part) ("Increased sharing by itself does not automatically mean increased competition. It is in the *un*shared, not in the shared, portions of the enterprise that meaningful competition would likely emerge. Rules that force firms to share *every* resource or element of a business would create, not competition, but pervasive regulation, for the regulators, not the marketplace, would set the relevant terms."); M. Stanton Evans, *Last Mile Is the Hardest*, Consumers' Research Magazine (Aug. 1, 2001) (quoting economist Tom Hazlett: "Neither local phone nor cable companies will make the enormous capital investment necessary to expand broadband, he argues, if 'open access' rules require them to share the resulting infrastructure with their competitors at below-market rates."); *MCI Restarts Marketing Local Residential Service in N.Y.*, Comm. Daily (Feb. 4, 1999) (quoting James Cicconi, executive vice president and general counsel,

own services *below cost* on its own initiative, or even just pared prices down to zero-margin "imaginary network" levels, it would be accused of "predatory pricing" – of attempting to discourage or ruin real competitors that were building competing networks alongside.

The unrestricted availability of UNEs discourages new ILEC investment, too. There is no incentive to invest in risky new infrastructure when the threat of future unbundling mandates directed at those facilities eviscerates the business case for deploying them. As AT&T's chairman has put it, "[n]o company will invest billions of dollars to become a facilities-based broadband services provider if competitors who have not invested a penny of capital nor taken an ounce of risk can come along and get a free ride on the investments and risks of others."[8]

But facilities-based investment is precisely what is needed. As the Commission has recognized, "the widespread deployment of broadband infrastructure has become the central communications policy of the day."[9] This will require "the complete or near-complete replacement of copper lines with end-to-end fiber optic transmission facilities."[10] The existing UNE regime significantly discourages investment in this new infrastructure, by both the facilities-based CLECs, and by the ILECs themselves.

A. Efficient Facilities-Based Entry.

The robust levels of competition now offered by numerous CLECs establish that facilities-based competition is possible. The business strategy that works is to enter by way of high-margin markets and value-added markets: the urban carrier and business markets first targeted by local fiber companies, and the wireless and broadband markets targeted by wireless, cable, and other facilities-based providers of switches and alternative forms of transport. These have been the successful entry points; facilities-based competition for the rest of the market has spread out rapidly from there.

AT&T: "[T]he last thing that government should do is create uncertainty that would have a chilling effect on, and perhaps even retard, these investments."); A. Wilson, *Harmonizing Regulation by Promoting Facilities-Based Competition*, 8 Geo. Mason L. Rev. 729 (Summer 2000) ("Regulatory uncertainty casts a pall over capital markets and dries up critical financial support. Communications policymakers must therefore create and sustain a stable regulatory environment if they want to nurture the development of facilities-based competition."); T. Jorden, J.G. Sidak, and D. Teece, *Innovation, Investment, and Unbundling*, 17 Yale J. on Reg. 8 (2000) ("It makes no economic sense for the ILEC to invest in technologies that lower its own marginal costs, so long as competitors can achieve the identical cost savings by regulatory fiat."); 3A Phillip Areeda & Herbert Hovenkamp, *Antitrust Law* ¶ 771(b), at 175 (1996) (When a company is to "provide [a] facility and regulat[es] the price to competitive levels, then the [prospective entrant's] incentive to build an alternative facility is destroyed altogether."); R. Cowles, *et al.*, Gartner Dataquest, *UNEs: Stifling U.S. Broadband Growth and Ineffective in Promoting Local Competition* at 5 (2002) (UNE policy has resulted in a "near-complete halt to advanced infrastructure investment from the incumbents and newcomers.").

[8] C. Michael Armstrong, Chairman and CEO, AT&T, *Telecom and Cable TV: Shared Prospects for the Communications Future*, remarks before the Washington Metropolitan Cable Club, Washington, D.C. (Nov. 2, 1998).

[9] *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Notice of Proposed Rulemaking, 17 FCC Rcd 3019, ¶ 1 (2002).

[10] *Id.*; *see also* R. Cowles, *et al.*, Gartner Dataquest, *UNEs: Stifling U.S. Broadband Growth and Ineffective in Promoting Local Competition* at 8 (2002) ("There is general recognition within the communications and information industry that fiber will ultimately be the most efficient and flexible end-to-end infrastructure").

1. Incremental Development of Facilities-Based Competition.

As demonstrated in Section I, the CLEC industry as a whole remains healthy. The most successful individual CLECs are those that have pursued a strategy of facilities-based entry. Their common business strategy has been to deploy facilities to serve high-margin markets first, then build out from there, to extend their competitive reach incrementally, into new service sectors and new geographic markets.

None of the successful competitors has emphasized factors that the Commission has at times deemed important – factors such as "ubiquity," or "rapid[]" entry to serve "the greatest number of customers."[11] None of the successful competitors has viewed ubiquitous service or instant roll-out as competitively necessary. None has proceeded on the assumption that the evolution of its business required the very rapid development of a very large footprint. To the contrary, they have prospered by emphasizing just the opposite, at the outset: smaller operations, carefully targeted at the most profitable geographic and service sectors.[12] Much broader competition has then evolved relentlessly from these facilities-based beachheads. And it has now reached the point where it is developing very rapidly indeed.

Switching. As discussed in Section II, competitive switches were first deployed by large business customers and then by competitive-access providers. This base of competitive switching capacity has since evolved, market by market, to serve smaller business customers and, most recently, residential subscribers. Adding customers and traffic at the margin has grown progressively cheaper. A switch deployed initially to serve the single large customer at a single point then serves a number of smaller customers, and then becomes part of larger network, serving additional, smaller, more widely dispersed sources of traffic.

Packet switching services have evolved in similar fashion. High-speed ATM and frame relay switches are deployed first to provide high-margin broadband data services. E-mail and messaging then begin to substitute, at the margin, for voice calls. Then two-way voice traffic migrates on to these packet switches.

As discussed in Section II, this evolutionary process is now robustly established, and the business model is well understood and mature. There are large numbers of competitive circuit switches in actual service. They can and do serve both large business and mass-market customers. Their geographic reach can be extended with trunks to remotes, and frequently is. Packet switches are multiplying even faster, and packet-switched traffic is now making very substantial in-roads into service areas traditionally served by circuit switches.

Fiber, Transport, and High-Capacity Loops. Competition has evolved in a similar fashion in the markets for transport and high-capacity loops. The interoffice transport and local

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[11] *UNE Remand Order* ¶ 107.

[12] *See, e.g.*, Time Warner Telecom, *Company Growth*, http://www.twtelecom.com/cgrowth.html ("growth plans focus on geographic expansion, extension into new market segments and development of new data and Internet-based products and services."); V. Bajaj, *Allegiance Will Borrow $ 350 Million to Invest*, Dallas Morning News (Sept. 19, 2001) (Allegiance has "pursued a more deliberate and slower national expansion than most of its competitors."); *Royce Holland, The Top Enterpreneurs*, Bus. Week (Jan. 14, 2002) (While its "rivals took on mountains of debt, the chief executive of Allegiance Telecom played it safe, borrowing little and expanding slowly.").

loop UNEs are both wireline facilities that transmit information between two fixed points. Here again, the early competitors first targeted a small number of high-margin opportunities, then built out from there. In the mid-1980s, "competitive access providers" ran their networks to the very largest customers in the largest geographic markets – long-distance carriers in the densest urban areas. Then, year by year, the CAPs extended both their networks and their businesses, to serve business customers, and less densely populated areas. Again, this process has matured; there are now extensive networks in place in all major urban markets.

Once a fiber network is deployed and the investment sunk, the facilities can be used to serve other on-net customers, including many whose traffic volumes would never have justified the original deployment of the network. Similarly, networks can be economically extended block by block, to points that would never have been economical to reach mile by mile. When they deploy fiber, carriers invariably deploy far more capacity than they can use immediately, to facilitate precisely this process of incremental future development.

This process of competitive evolution is now accelerating rapidly, for two reasons. Extensive competitive networks are already in place; the marginal cost of extending them to pick up new customers is far lower, now, than it was at the outset. And surging volumes of data traffic make the deployment of competitive fiber increasingly economical, for an ever-expanding base of potential customers. CLECs now routinely offer service to many business customers that are not already served by their fiber networks; the CLEC will extend its network one spur or branch at a time, to pick up the new traffic.

Narrowband Loops. Wireless has emerged as a serious competitor to the narrowband ILEC loop through a similar, at-the-margin process of upgrading the network and capturing economies of scope and scale. Wireless began as a high-priced service for the handful of high-end customers willing to pay a high premium for a mobile loop. Over time, wireless operators were able to begin competing for a greater segment of customers willing to pay for mobility. As they have built out their networks, wireless carriers have begun to compete directly for virtually all second-line loops, and for an increasing share of primary-line loops as well.

Cable, which offers not one but two important alternatives to the ILEC loop, has evolved as competitive alternative in a similar way. Coaxial cable networks were originally deployed to offer video. With these networks in place, a number of cable operators found it economical to add circuit-switched voice telephony and high-speed data capabilities. Cable now competes directly against ILEC loop for the last-mile transport of packet-switched data traffic, which now accounts for substantially more than half of all telecom traffic. And in many areas, cable competes directly with ILECs for primary line voice service as well.

Broadband. A broadband link to the packet-switched network provides a connection to all other Internet users, whether linked through telephone lines, cable modems, land-based wireless connections, or satellite connections. In the past three years, cable operators have completed outfitting the vast majority of their networks with two-way capabilities. Almost all cable operators are now rapidly deploying high-speed data capabilities. The costs of upgrading cable plant have been falling steadily, and cable operators have captured very significant economies of scope in deploying digital platforms that can be used for digital television and high-speed data, as well as packet-switched voice.

Much of the new broadband infrastructure has had little relation to the old. Fiber has replaced copper in the loop; packet switches have replaced circuit switches in the central office; and the transport between these packet switches has used very different routes than the rigid point-to-point connections between central offices. In deploying this new infrastructure, ILECs have thus enjoyed no particular advantages over competing carriers.

2. Economies of Scope and Scale.

In the *UNE Remand Order*, the Commission found that, "[b]ecause competitors do not yet enjoy the same economies of scale, scope and ubiquity as the incumbent, they may be impaired if they do not have access, at least initially, to certain network elements supplied by the incumbent LEC."[13] As discussed above, however, the assumption that immediate scale and scope economies are essential to competitive success is not borne out by actual experience in the marketplace. The successful competitors have started out with high-*margin* business strategies, not high-*volume* strategies, and expanded incrementally from there. The economies of scope and scale have followed, not led, the competitive process.

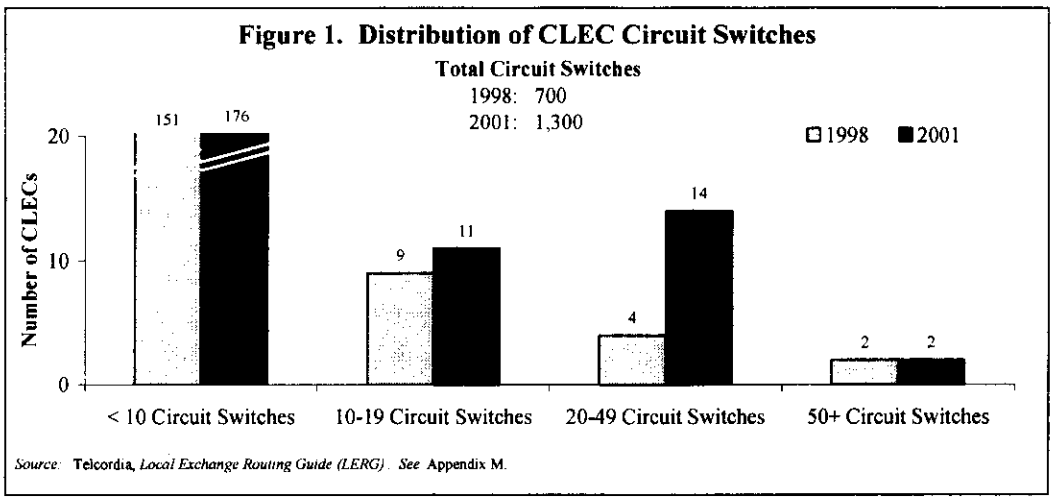
With that said, incremental growth has now culminated in a significant number of CLECs that enjoy very significant economies of scale. As Table 2 indicates, the twenty largest CLECs today have 100 percent more switches, 190 percent more fiber-route miles, and earn 150 percent more in total revenues than the twenty largest CLECs at the time of the *UNE Remand Order*. *See* Table 2.

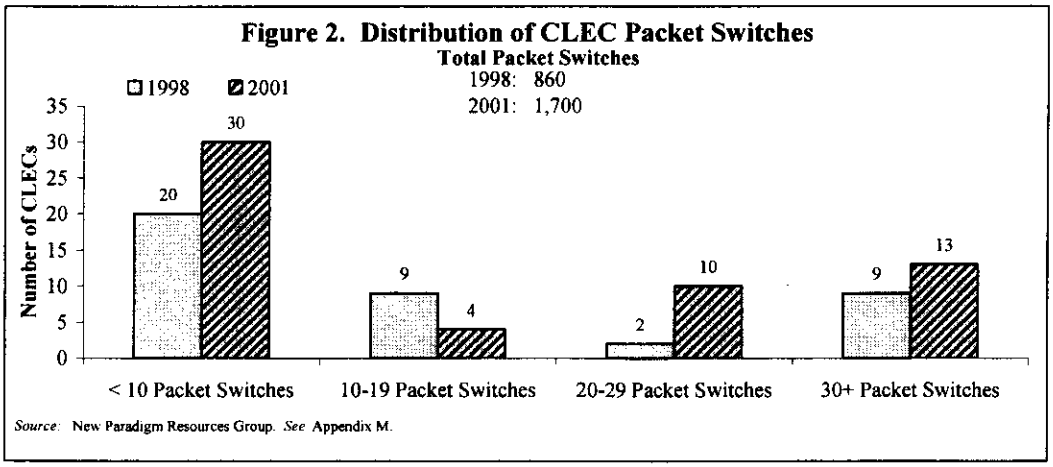
[13] *UNE Remand Order* ¶ 14.

Table 2. Twenty Largest CLECs (by Revenues): 1998 vs. 2001							
1998				2001			
CLEC	Revenues ($millions)	Circuit Switches	Fiber Route Miles	CLEC	Revenues ($millions)	Circuit Switches	Fiber Route Miles
AT&T	$7,451	88	11,400	WorldCom	$16,716	120	n/a
WorldCom	$4,894	104	8,811	AT&T	$16,000	246	16,000
Intermedia	$713	31	839	McLeodUSA	$1,800	34	31,000
McLeodUSA	$604	4	7,120	XO	$1,180	39	20,661
ICG	$398	9	4,242	Time Warner Telecom	$775	38	15,249
General Comm.	$247	3	200	Allegiance	$545	26	5,000
RCN	$245	2	1,400	RCN	$520	10	9,030
BTI Telecom	$213	n/a	110	ICG	$480	35	5,500
ITC^DeltaCom	$172	n/a	7,800	Adelphia	$475	28	19,186
ALLTEL	$167	5	0	KMC Telecom	$450	33	2,336
GST Telecom	$163	20	6,632	Network Plus	$410	3	n/a
e.spire	$157	18	1,742	ITC^DeltaCom	$400	42	9,980
Global Crossing	$153	16	0	e.spire	$375	25	3,834
WinStar	$141	27	0	Cox	$350	13	9,000
NEXTLINK	$140	18	2,477	Focal Comm.	$345	19	n/a
Time Warner Telecom	$122	18	6,968	CTC Comm.	$336	2	8,300
CapRock Comm.	$122	n/a	800	General Comm.	$330	3	200
Ionex	$114	n/a	1,400	BTI Telecom	$320	14	4,400
Network Plus	$106	2	0	CoreComm	$300	7	n/a
Electric Lightwave	$101	7	3,091	Global Crossing	$260	24	400

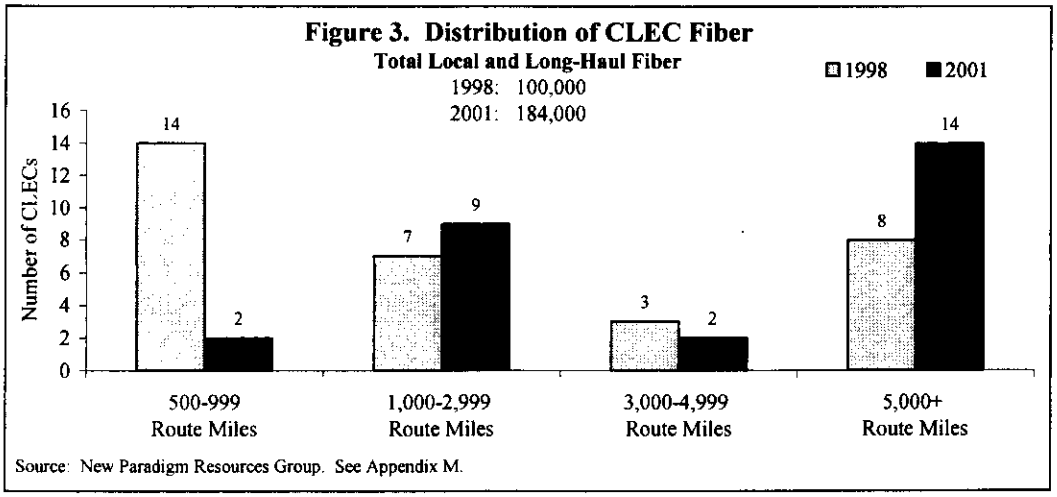
Sources: Telcordia, *Local Exchange Routing Guide (LERG)*; New Paradigm Resources Group. *See* Appendix M.

Switches. At the time of the *UNE Remand Order*, only 15 CLECs had deployed 10 or more circuit switches, and only 6 had deployed 20 or more. *See* Figure 1. Today, at least 27 CLECs have deployed 10 or more circuit switches, and at least 16 have deployed 20 or more. *See id.* The increase in the size of CLEC data networks has been equally dramatic. At the time of the *UNE Remand Order*, only 20 CLECs had deployed 10 or more packet switches, and only 11 CLECs had deployed 20 or more. Today, at least 27 CLECs have deployed 10 or more packet switches, and at least 23 CLECs have deployed 20 or more. *See* Figure 2.





Fiber, Transport, and High-Capacity Loops. At the time of the *UNE Remand Order*, only 18 CLECs had deployed 1,000 or more route miles of local and long-haul fiber, only 11 had deployed 3,000 or more, and only 8 had deployed 5,000 or more. Today, at least 25 CLECs have deployed 1,000 or more route miles, 16 have deployed 3,000 or more, and 14 have deployed 5,000 or more. *See* Figure 3.



Wireless Alternatives to the Narrowband Loop. At the time of the last UNE review, there were only three "nationwide" mobile telephony operators, as the FCC defines that term.[14] Today, there are six nationwide operators.[15] At the time of the last UNE review, the ten largest mobile wireless operators had an average of 5.1 million subscribers each. Today, the ten largest mobile operators have an average of 9.4 million subscribers each.[16]

Broadband Alternatives to the High-Frequency Loop. At the time of the last UNE review, deployment of broadband was still "in the early stages of development."[17] At that time, cable operators had only about 300,000 broadband customers.[18] Today, by contrast, cable operators have approximately 7.5 million broadband customers.[19]

3. Emergence of Competitive Resale Markets.

Across the board, competition has now advanced to the point that competitive wholesale markets are now emerging. The players in these markets are the markets' own answer to the Commission's UNE regime – they offer reasonably close analogies to unbundled network elements, at wholesale prices.

As discussed in Section III.C, there has been a dramatic increase in fiber supplied by alternative wholesale suppliers. These players typically sell or lease dark fiber to other carriers, but do not themselves engage in the provision of telecommunications services. They have raised about $2 billion in capital since the third quarter of 2000,[20] and analysts expect this market sector to grow rapidly.[21] A Web-based trading pit for the urban fiber that they provide now includes over 35 fiber wholesalers listing "over 10,000 *local* route miles" of fiber[22] in more than 60 cities.[23] For a growing number of CLECs, the fiber provided by these wholesale suppliers satisfies a large part of their demand for last-mile local connectivity and interoffice transport.

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[14] *See Fourth CMRS Report* at 9.

[15] *See Sixth CMRS Report* at 13.

[16] *Compare Fourth CMRS Report*, App. B at Table 4 *with Sixth CMRS Report*, App. C at Table 3.

[17] *First Advanced Service Report* ¶ 16.

[18] *See* Cable Datacom News, *December 1998 Highlights*, http://cabledatacomnews.com/dec98/dec98-1.html.

[19] *See Morgan Stanley Cable Modem/xDSL Report* at Exh. 3 (cable modem subscribers as of 4Q 2001).

[20] P. Brown, *Despite Tighter Purse Strings, Cash Is Still Streaming to Metro Providers*, Tele.com (Aug. 13, 2001) (citing Yankee Group and quoting Blake Bath, telecom analyst at Lehman Brothers Equity Research).

[21] According to consulting firms Cambridge Strategic Management Partners and McKinsey & Co, "[t]he market for reselling . . . dark fiber to ISPs and telecom carriers is projected to grow from about $2 billion today to about $10 billion by 2006." *See* N. Orman, *Networking Startups Battle For Cities*, Silicon Valley/San Jose Bus. J. (Oct. 26, 2001).

[22] D. Mohney, *Fiberloops.com – One-stop Shopping*, ispworld.com (Aug. 22, 2000).

[23] Fiberloops.com, *Find Fiber and Facilities Fast*, http://www.fiberloops.com/Fiberloops/home.html.

Resale markets have likewise developed for the provision of wireless services.[24] As the Commission has noted, wireless resellers "offer service to consumers by purchasing airtime at wholesale rates from facilities-based providers and reselling it at retail prices."[25] According to the Commission's *Sixth CMRS Report*, the top 20 resale providers had just over 3 million subscribers as of year-end 2000, twice as many as they did in 1999.[26] Wireless carriers hammered out wholesale contracts among themselves years ago, to cover "roaming"; intercarrier roaming rates have been rapidly declining.[27] And wireless carriers enter into wholesale deals with large corporate customers, too.[28] At least 20 percent of businesses provide wireless services to their employees through deals they have negotiated with carriers to provide discounted rates for preset call volumes.[29]

A wholesale/resale market for broadband links is now beginning to emerge as well. GTE and AOL began open access trials in 1999, proving that "[c]able providers can easily and affordably open up their networks for high-speed Internet competition."[30] Many cable companies assert that open access will occur naturally, and that it is in both their best interest and that of consumers.[31] And many have already entered into agreements to allow unaffiliated ISPs access to their networks.[32]

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[24] Early on, the Commission granted cellular A-side carriers certain rights to resell the B-side (*i.e.*, typically incumbent wireline) carriers' services, to maintain early competitive parity notwithstanding the head-start that the B-side carriers got in building out their networks. *See* 47 C.F.R. § 20.12 (b)(3). Those resale rights will expire in November 2002, however.

[25] *Sixth CMRS Report* at 34.

[26] *Id.* at 34-35.

[27] *See, e.g.*, *Yankee Group State of the Wireless Union Report* at 6; M. Berghausen, Morgan Stanley Dean Witter, Investext Rpt No. 8313844, AllTel Corp.: Initiating Coverage – Company Report at *3 (Dec. 21, 2001).

[28] *See, e.g.*, H. Smith, *Verizon Adds to Telematics Stable with Wingcast Partnership*, RCR Wireless News at 2 (Dec. 17, 2001) (The one million-plus users of General Motors' OnStar service in luxury cars, for example, are in fact served via Verizon Wireless's network. Verizon Wireless has entered into a similar agreement with Wingcast, a joint venture between Ford Motor Co. and Qualcomm.).

[29] *See, e.g.*, M. Hamblen, *Wireless Merger a Boon for National Coverage*, Computerworld (Sept. 27, 1999).

[30] *GTE Demonstrates Ease of Cable Open Access to Multiple ISPs; Clearwater Trial Shows One-Time Investment of Less Than $1 Per Home Would Provide Consumer Choice*, Bus. Wire (Jan. 14, 1999) (quoting AOL senior vice president George Vradenburg).

[31] *See, e.g.*, A. Siedsma, *Gov Watch a Question of Access*, T Sector (Feb. 1, 2001), http://www.thetsector.com/showStory.cfm?ts_story_id=838 (Bill Geppert, VP and GM of Cox in San Diego, emphasized the "strong willingness on the part of broadband providers to offer multiple ISPs as part of their platform," with Cox and other companies "moving in that direction."); M. Martin, *Cable's Connections*, Wash. Bus. J. (Jan. 28, 2000), http://washington.bcentral.com/washington/stories/2000/01/31/focus1.html (George Vradenburg, AOL: "open access promotes consumer choice in high-speed Internet service and will encourage innovation in new Internet applications."); Statements by C. Michael Armstrong, Chairman and Chief Executive Officer, AT&T Corp., in *Telecom Mergers: En Banc Hearing on Telecom Mergers To Discuss Recent Consolidation Activities in the Telecommunications Industry, Focusing on Three of the Proposed Mergers Before the Federal Communications Commission* (Oct. 22, 1998) (open access is "[f]irst . . . the right thing to do. Second, it's in our self-interest. . . . Content is essential to make money in networks. The only way to make money in networks is to have the highest degree of utilization.").

[32] *See, e.g.*, *AT&T Broadband Opens to Other ISPs*, Associated Press (Mar. 13, 2002); M. Mosquera, *Time Warner to Open Cable Network to Earthlink*, Internet Week (Nov. 20, 2000), http://www.internetweek.com/story/

4. Geographic Expansion

The Commission stated in the *UNE Remand Order* that "markets outside of major metropolitan areas . . . have seen minimal competition."[33] That is no longer the case today. CLECs are now using their facilities to serve markets of all sizes, throughout the country. For example, CLECs have obtained collocation arrangements to serve wire centers that contain more than 80 percent of the access lines in the Bell companies' regions.[34] And CLECs are using their own switches to serve customers in wire centers that contain approximately 86 percent of all lines in the Bell companies' regions.[35]

Many CLECs have specifically targeted smaller markets, often precisely because the larger markets have already become saturated with facilities-based competition. Analysts have noted that "[i]n tier 2/3 markets, fundamentals are more favorable primarily due to less available capacity."[36] More than a dozen CLECs have adopted a strategy of specifically serving smaller markets (*e.g.*, Tier II, Tier III, or Tier IV markets). *See* Table 3. In addition, many CLECs that serve larger markets, have expanded into smaller markets as well.[37]

INW20001120S0002; R. Mark, *Cox Begins Its First Open Access Broadband Trials*, Internetnews.com (Nov. 6, 2001), http://www.internetnews.com/isp-news/article/0,,8_917471,00.html.

[33] *UNE Remand Order* ¶ 11.

[34] *See* Section II.A.2, Table 10.

[35] *See* Section II.A.1, Table 5.

[36] J.M Ackor, RBC Capital Markets, Investext Rpt No. 8239217, Broadband Services – Bandwidth Pricing Update – Industry Report at *1 (Oct. 29, 2001).

[37] *See, e.g.*, S. Weinburg, C. Shobrook, G. Mycio and L. Singleton, *Appraising the CLEC Landscape*, Xchange Magazine (June 2000), http://www.xchangemag.com/articles/061feat1.html ("The current trend, however, shows that while CLECs are developing a foundation among first-mover small and medium-sized businesses in large markets, there is a trickling downward of services into Tier 2 and 3 markets.").

Table 3. Examples of CLECs That Have Specifically Targeted Smaller Markets	
Advanced TelCom Group	Offers "bundled Internet, broadband data, and voice services to small and medium-sized businesses in third and fourth tier markets throughout the U.S."; targets third and fourth tier cities with populations between 100,000 and 750,000 people and between 50,000 and 200,000 business access lines."
AFN Communications	"AFN is targeting underserved markets . . . 'We think this will clearly give them an opportunity to establish a beachhead. They are targeting a market opportunity that has gone untapped by the current crop of service providers.'"
BayRing Communications	"BayRing is a regional CLEC offering local, long distance, high-speed Internet service, and dedicated access to businesses in Tier 3 markets in New Hampshire and Maine."
Choice One Communications	"Our company currently provides service to clients in 30 second and third-tier markets in eleven states where there are fewer competitors than in larger metropolitan areas."
Cinergy Communications	"The focus for Cinergy Communications is toward small businesses in the region of Southern Indiana and Western Kentucky. Cinergy believes it can offer telecom services to areas that otherwise do not have many choices."
Volaris Online (formerly DUROCOM)	"DUROCOM is a full service, facilities-based provider of Internet data and broadband communications solutions to consumers and small to medium-sized businesses in tier II and tier III markets in the southeastern United States."
e.spire Communications	"e.spire's establishment of footholds in 'uncrowded' Tier 2 and Tier 3 markets represented arguably the company's most significant competitive advantage," says Lizet Tirres, research analyst, Stratecast Partners.
Crescent Telephone	"'Our proven track record in serving rural and suburban customers ideally positions Crescent Telephone to offer complete telecommunications solutions to markets historically underserved by traditional carriers,' said Jacob Roquet, GIEX president and CEO, and founder of CoastalNet and Crescent."
KMC Telecom	"KMC's business has two distinct components: serving communications-intensive customers in markets with populations between 100,000 and 750,000, referred to as Tier III markets, which larger carriers have typically overlooked; and providing data services on a nationwide basis."
Knology	Although CEO Rodger Johnson "admits his markets aren't crowded with competitors, he says the idea that second and third tier markets are less competitive is a myth. 'When you get down to markets with 100,000 [homes], you can't divide that pie up more than about three ways and make it economically viable,' he says."
LecStar Communications	"LecStar focuses on underserved markets in the south... LecStar believes these secondary cities are relatively underserved."
Lightship Telecom	"Lightship Telecom is targeting small to medium-sized businesses in Tier Two and Three markets."
NECLEC	"NECLEC offers voice and data services primarily in Tier Two, Three, and Four cities in the Northeast/Mid-Atlantic region."
Sources: See Appendix M.	

To be sure, facilities-based competition has inevitably emerged earlier in some markets, and later in others. States with larger concentrations of business customers[38] are more attractive

[38] The percentage of switched business lines as a percentage of total switched lines in the state varies from as low as 25 percent (in Tennessee) to as high as 69 percent (in Washington, D.C.). *See FCC Statistics of Common*

to competitors.[39] More rural states are more costly to serve.[40] Regulatory differences have played a major role too. As noted earlier, some states have imposed wholesale rates on ILECs that artificially suppress the emergence of facilities-based competition.[41] Some states opened their local markets to competition before the passage of the 1996 Act, and much earlier than some other states.[42] Some states have set retail rates – particularly for residential customers – very low, which also discourages entry.[43]

B. The Failure of Non Facilities-Based Competition.

Since the last UNE review, many CLECs have attempted to enter local markets very rapidly, on a very large scale, by relying exclusively, or almost so, on UNEs obtained from ILECs. The Commission at one time suggested that these competitors would rely on UNEs only until such time as it "was practical and economically feasible to construct their own networks."[44] Many of these ostensible competitors, however, have adopted business strategies that do not involve deployment of their own facilities at any time in the foreseeable future. Investors have grasped that these business models offer little if any true value to customers. Many of the CLECs pursuing UNE-centric strategies have failed.

Carriers, 2000/2001 ed. at Table 2.4. New York, California, Texas, Illinois, and Ohio are home to the greatest number of Fortune 500 company headquarters – more than 200 companies, collectively. No Fortune 500 company has established its headquarters in 10 states (Alaska, Hawaii, Maine, Montana, New Hampshire, New Mexico, North Dakota, Vermont, West Virginia, and Wyoming). *See Fortune 500 List*, Cincinnati Enquirer (Apr. 2, 2001), http://enquirer.com/editions/2001/04/02/fin_fortune_500_list.html.

[39] *See, e.g.*, FCC, *Biennial Regulatory Review 2000 – Staff Report*, App. IV, Pt. 54, 15 FCC Rcd 21089, 21266 (2000) ("Competition for business customers in metropolitan areas has, in general, developed more rapidly than competition for residential customers or customers in rural areas."); *FCC Local Competition Report, Dec. 1998 ed.* at 2 ("Facilities-based CLECs appear to have concentrated in more urbanized areas.").

[40] Rural populations vary widely between states, from a low of 10.6 percent in New Jersey in 1990, to a high of 67.8 percent in Vermont in 1990. *See* U.S. Census Bureau, *Urban and Rural Population: 1900 to 1990* (Oct. 1995) http://www.census.gov/population/censusdata/urpop0090.txt. Under the FCC's USF cost model, costs of providing service vary significantly (by as much as 50 percent of more) between highly rural and highly urban states.

[41] *See, e.g.*, James Eisner, FCC, & Dale Lehman, Fort Lewis College, *Regulatory Behavior and Competitive Entry*, for presentation at the 14th Annual Western Conference Center for Research in Regulated Industries, at 2 (June 28, 2001).

[42] *See, e.g.*, *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, Notice of Proposed Rulemaking, 11 FCC Rcd 14171, ¶ 5 (1996) ("At the time the 1996 Act was signed, 19 states had in place some rules opening local exchange markets to competition, including seven states in which competing firms had already begun to offer switched local service.").

[43] *See Sprint v. FCC*, 274 F.3d 549 (D.C. Cir. 2001) (noting that one of the reasons put forward by the FCC's counsel for low rates of competition in the residential market is that "state commissions have historically set relatively low residential rates . . . allowing the incumbent monopoly to make it up in other aspects of their business."); R. Cowles, *et al.*, Gartner Dataquest, *UNEs: Stifling U.S. Broadband Growth and Ineffective in Promoting Local Competition* at 7 (2002) ("Most states have frozen residential basic exchange rates at levels at or below cost. . . . it is the regulators themselves (state regulators and the FCC) that have created this regulatory barrier to competitive entry through a pricing policy that includes subsidy.").

[44] *UNE Remand Order* ¶ 6.

1. The Failure of UNE-Platform Competition.

The UNE Platform is "physically similar to resale. In each case, the CLEC uses the ILEC network to provide service to the end-user and essentially limits its own functions to marketing, inputting the order into the ILEC's systems, and billing."[45] UNE-P requires no incremental investment by a CLEC, but – because of regulatory factors alone – it is generally cheaper than deploying facilities. With the exception of certain vertical features that no more than a few Platform-based CLECs actually provide, end-user customers do not receive any services on any facilities from a UNE-Platform provider that they would not also receive in the simple resale of the ILEC's own service. UNE-P "competition" thus creates little if any opportunity for service differentiation. This competition is not value-added competition at all; it is defined not by expanding output, consumer choice, product quality, or market price, but by federal and state regulators and the TELRIC pricing regime.

As discussed in Section II.A.2, CLECs that rely on the UNE Platform argue that it provides a mechanism for CLECs to build up a customer base before they invest in facilities. But market experience since the time of the *UNE Remand Order* demonstrates that CLECs are not migrating UNE Platform customers to their own facilities to any significant degree (if at all). Many CLECs instead treat UNE-Platform competition as an end in itself, rather than as a stepping stone to facilities-based competition. These CLECs have obtained UNE Platforms to serve mass-market customers but have no plans to convert these customers to their own switches.[46] Conversely, most of the CLECs that serve mass-market customers and that *have* deployed one or more switches of their own make little or no use of unbundled switching from the BOCs.[47]

The UNE-centric CLECs are not only failing to create any facilities-based competition of their own, they have harmed their facilities-based counterparts, too. Facilities-based CLECs recognize that the unrestricted availability of UNEs priced at a regulator's estimation of long-term incremental cost can ruin a business making steep capital investments at here-and-now, real-world prices. As described above, these facilities-based CLECs view the availability of the full UNE Platform as particularly harmful to facilities based competition. *See* Table 1, *supra*.

2. The Failure of the DLEC Model.

"Data CLECs" or DLECs made a similar attempt to jumpstart ubiquitous competition, and were equally unsuccessful. Their business model centered exclusively on providing DSL services. Unlike the UNE-P competitors, the DLECs did typically deploy their own packet switches. But in the broadband market, most of the new value is in getting the broadband loop

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[45] Commerce Capital Markets, *Status and Implications of UNE-Platform in Regional Bell Markets* (Nov. 12, 2001).

[46] *See* Section II.A.2.

[47] *See* Section II.A.2, Figure 4.

itself up and running. That's a difficult challenge on any medium, but an especially difficult one on copper, which wasn't designed for broadband in the first place.[48]

The ILECs themselves have certainly found the deployment of DSL service to be a difficult and costly process[49] – with all the resources at their command, it has taken ILECS more than three years to make the service available to just over 40 percent of the homes they serve.[50] Once the infrastructure is ready for broadband service, it then takes between two and three years to break even on a new DSL customer.[51] The DLECs simply ignored these engineering and economic realities. They cultivated the belief that DSL was easy and inexpensive to deploy.[52] They promised to deploy broadband services faster and more efficiently than incumbent local telephone companies or cable operators.[53]

To grow quickly, the DLECs relied on a business model that centered around resale of the ILECs' loops, with relatively little of the CLECs' own facilities-based investment. In most of the central offices that they intended to serve, the DLECs planned to deploy only a single

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[48] *See, e.g.*, L. Gerhardy, *et al.*, Morgan Stanley, Dean Witter, Investext Rpt No. 2262978, Globespan: Initiating Coverage – Company Report at *12 (Aug. 17, 2000) ("While simple in theory, the deployment of high bandwidth services over infrastructures originally designed for simpler purposes has created significant challenges . . . . Most of the Tel-co's wiring infrastructure is decades old, and only a small portion of the frequency spectrum available on the wire was used. However, new digital technologies that exploit the unutilized Telco bandwidth encounter problems from the legacy analog environment for which the infrastructure was designed.").

[49] *See, e.g.*, P. Harvey, *The Last Mile is a Rocky Road*, Red Herring (Aug. 1, 2000) ("For DSL providers, one of the biggest hurdles has been the time and expense required to send a truck and technicians to each home that requests service."); Infinilink Corp. White Paper, *Confronting the DSL Bottleneck, or "Why Does It Take So Long to Install DSL?"* (Dec. 2000) (Truck rolls cost on average $300 each, and it takes an industry average of 2.7 truck rolls per DSL line deployed.)

[50] *See JP Morgan Cable Industry Report* at Figures 12 & 36 (estimating that DSL is available to approximately 43 percent of households as of 1Q 2001).

[51] *See, e.g.*, G. Miller, *et al.*, ABN AMRO, Investext Rpt No. 8150475, Sprint Corp. – Company Report at *8 (Aug. 9, 2001) ("We point out that DSL today is not profitable for a single carrier out there, including SBC, Verizon, and BellSouth. With a payback period of 18 to 24 months, we do not believe any of these carriers will turn a profit until next year, at the earliest."); *Broadband 2001* at 76 (incremental DSL customers break even on a net present value basis after 3.4 years); J. Bellace and S. Bhasin, Jefferies and Co., DSL Update: U.S. Broadband Penetration Forecasted to Increase from 11% at Year-End 2001 to 17% by Year-End 2002 at 4 (Feb. 4, 2002) ("the number of months it takes to breakeven on a DSL subscriber will decline from 24 months in 2001 to 10 months in 2005.").

[52] *See, e.g.*, K. Fong, *et al.*, Hambrecht & Quist Inc., Investext Rpt No. 2658327, Communications Symposium/Data Processing/Telecom – Industry Report at *39 (Apr. 16, 1998) (In early 1998, Covad's chairman proclaimed that "DSL technology is unique in that it has an almost zero cost-per-home pass, an almost zero up-front, fixed-investment cost. . . it can be deployed rapidly because no one has to dig up the streets, no one has to pay franchise fees, and no one has to get city permits to allow this technology to happen."); S. Schmelling, *DCLECs Declassified: The Big Three of Data Are So Much Cooler Than Their Name*, Upstart (Oct. 4, 1999) (Rhythms's CEO likewise noted that "on a level of difficulty, [DSL is a] two on a scale of one to ten.").

[53] For example, in December 1998 – after being operational for just 10 months – one data CLEC proclaimed that it "will be able to provide DSL service to more business customers than all the Baby Bells combined." *NorthPoint Communications Will Surpass Combined Bells' DSL Deployment*, Bus. Wire (Dec. 15, 1998); *see also* J. Henry, *et al.*, Bear, Stearns & Co., Inc., Investext Rpt. No. 2748881, Global Telecommunications: Weekly Performance Review – Industry Report at *3 (Mar. 1, 1999) ("Rather than attempting to establish blanket coverage of each market served in order to provide the densest coverage for its wholesale customers, Rhythms seems intent on establishing the most dots on its national network map as soon as possible.").

piece of equipment – a Digital Subscriber Line Access Multiplexer (DSLAM). DSLAMs vary in price depending on their capacity, but average "well under $200" per customer line – an investment of just $3 per month per line for each customer (conservatively assuming a five-year customer retention rate).[54]

The DLECs did not even intend to provide their own facilities-based connections to the Internet. Instead, they enlisted hundreds of Internet Service Providers to take charge of that end of things. The DLECs themselves acted merely as wholesale brokers – obtaining the loop from an ILEC on one side, and a connection to the Internet through an ISP on the other. The DLECs opted not even to attempt to offer voice services, which would have enabled them to collaborate and share facilities with their sibling voice CLECs.[55] This strategy, the DLECs maintained, would let them grow very rapidly, on very small capital outlays.[56]

More than 20 DLECs began providing service between 1998 and the first quarter of 2000.[57] Nine completed successful initial public offerings (IPOs), raising more than $1.3 billion in capital. The DLECs that went public had been in operation an average of less than 3 years; they had few lines in operation (an average of only 1,545); and they had a very limited cadre of employees (an average of 273). *See* Table 4. The companies themselves routinely admitted that

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[54] D. Burstein, *DSL Prime News: The Inside Source*, CLEC-Planet (Oct. 2, 2001), http://www.clec-planet.com/tech/oct2dslprimea.html; *Broadband 2001* at 70 (cost of buying and operating a DSLAM at $174 per subscriber add); ZD Net, *ZD Net Shopper, Resellers*, http://zdnetshopper.cnet.com/shopping/resellers/0-11796-1411-403544-0.html (the Paradyne HotWire 8800 DSLAM 20 slot chassis – 48VDC costs around $4200 or $210 per slot); D. Burstein, *DSL Prime Newsletter*, CLEC-Planet (May 18, 2001), http://www.clec-planet.com/tech/0517dslprimea.htm ("[T]he primary costs involved [with provisioning DSL] are the shared line ($0-6 per month) and the DSLAM (whose price is under $200/ per line, or $4/month over five years).").

[55] As with ordinary Internet access service, DSL quickly became a commodity-like service, "due to the lack of differentiation in the levels of service and increased competition amongst Service Providers." Cisco Press Release, *Cisco Announces Industry's Most Comprehensive Portfolio of Customer Premises Equipment for Value-Added Business DSL Service* (Sept. 18, 2000). *See also* V. Grover, Kaufman Brothers, Investext Rpt. No. 2205121, Network Access Solutions Corp. – Company Report at *1 (June 28, 2000) ("DLECs . . . are now heavily exposed to commoditization of the access portion of their businesses because they do not own customer relationships and therefore cannot layer enhanced services onto their revenue streams."); V. Ryan, *Headed for a Fall?*, Telephone (Dec. 18, 2000) ("DSL wholesalers are trying to rescue customers from bankrupt ISPs and adapt to the commoditization of their primary business."); K. Higgins, *Intelligence at the Network Edge*, Network World at 41 (Aug. 21, 2000) ("customers . . . increasingly regard high-speed Internet access as a commodity. To compete successfully, DSL service providers must differentiate themselves by offering a range of value-added services, including multiline, toll-quality voice service; VPNs; frame relay; videostreaming; and emerging productivity and entertainment applications.").

[56] R. King, *Run Silent; Run Deep*, Tele.com at 70 (Apr. 1998) (quoting Covad's chairman stating that reliance on ISP important in order "to be able to roll the service out quickly and get the maximum amount of volume on our service that we can."); Rhythms NetConnections, Form 10-K405 at 7 (SEC filed Mar. 30, 2000) (relying on an ISP will "increase[] volume and reduce[] costs by serving multiple resellers and leveraging their selling efforts."); NorthPoint Communications Group, Form 10-K405 (SEC filed Mar. 30, 2000) (relying on ISPs would "enabl[e] [its] sales force to focus on prospective high-volume wholesale customers; amortize the cost of [its] fixed capital expenses over large base of end users more rapidly; minimize [its] end user support costs; and achieve a nationwide presence more quickly.").

[57] An additional 18 traditional CLECs also began offering DSL services during this period.

their business models and strategies were "unproven"[58] and had not been "validated . . . in the market."[59]

Table 4. Operating Statistics for Public DLECs at Time of IPO						
	Date of IPO	Funds Raised by IPO	Employees	Annual Revenue	Annual Losses	DSL Lines in Service
Choice One	02/16/00	$164M	390	$11.7M	$34M	206
Covad	01/22/99	$150M	335	$2.6M	$28M	1,948
DSL.net	10/12/99	$50M	146	$184,000	$6.5M	463
Log On America	04/22/99	$25M	13	$760,000	$422,000	n/a
Mpower	05/15/98	$63M	145	$3.8M	$10.8M	0
Net2000	03/10/00	$212M	485	$28M	$39M	n/a
NAS	06/03/99	$82M	141	$4.8M	$2.5M	300
NorthPoint	05/05/99	$386M	423	$931,000	$29M	5,700
Rhythms	04/12/99	$210M	400	$528,000	$36M	650
Sources: See Appendix M.						

Then, between March and December 2000, the Internet bubble burst. The nine publicly traded DLECs lost more than 94 percent of their stock-market value. Industry insiders attributed this to the DLECs' "unsound business models," their failure to "own the physical layer," and their decision to "run[] on another firm's network."[60]

The failed DLECs were eventually absorbed by more successful CLECs, often at a bargain price. AT&T and WorldCom acquired the two largest failed DLECs – NorthPoint and Rhythms; several other DLECs were likewise acquired by successful CLECs.[61] Significantly, in

[58] NorthPoint Communications, Form S-1 (SEC filed Feb. 26, 1999).

[59] Rhythms NetConnections, Form S-1 (SEC filed Feb. 16, 1999).

[60] L. LaBarba, *Who's Saving Whom?*, Telephony (Dec. 18, 2000) (quoting Russ Intravartolo, CEO of ISP wholesaler Starnet: "There is no profitable way into DSL unless you own the physical layer."); *id.* (quoting Gary Steele, vice president of product development for PathNet: "What's going on in the industry may not be consolidation as much as it is the death of unsound business models."); M. Martin, *Caution Flags Flying as CLEC Woes Mount*, Network World (Nov. 20, 2000), http://www.nwfusion.com/news/2000/1120clec.html (quoting Current Analysis analyst Jeff Moore: "It's hard to be profitable when you're running on another firm's network."); *Regional DSL Report: Boston*, ISP Planet (Dec. 15, 2000), http://www.isp-planet.com/news/dsl_report_boston.html (quoting Vitts CEO and Chairman: The DSL providers "adhere[d] to business plans resembling those of failed dot-com retailers: grow big and fast, no matter the cost of 'buying' customers."); S. Woolley, *Highway to Hell*, Forbes (Feb. 19, 2001) ("The whole structure made zero sense from an economic standpoint.").

[61] *See, e.g.*, WorldCom Press Release, *WorldCom Closes Rhythms Transaction* (Dec. 5, 2001) (WorldCom acquired the assets of Rhythms NetConnections for $31 million. The deal was closed approximately one month in advance, resulting in a more than 20 percent reduction in acquisition cost.); AT&T News Release, *AT&T Acquires Assets of NorthPoint Communications* (Mar. 22, 2001) (AT&T acquired "substantially all of the assets of NorthPoint Communications" for approximately $135 million. "We are delighted to be acquiring NorthPoint's DSL assets," said Robert M. Aquilina, co-president of AT&T Consumer. "They will help us in our efforts to move aggressively to bring the full benefits of DSL to consumers and businesses. These benefits include high-speed Internet access, local and long distance calling, and exciting broadband services, including virtual private networks, among other possibilities, in the future."); Cavalier Telephone Press Release, *Cavalier Telephone Completes Purchase of Net2000 Communications*

some of these cases, the acquiring CLEC took only the assets of the failed DLEC – primarily collocation space – not its customers.[62] If they had viewed "rapid" and "ubiquitous" entry as the keys to the competitive success, the acquiring companies would presumably have done just the opposite.

C. Anti-Competitive Impacts of Expanding UNEs into Competitive Markets.

While the unbundling regime was intended to promote competition for local exchange services,[63] both interexchange carriers and wireless carriers have demanded that ILECs also unbundle the inputs used in the provision of long distance and wireless services. These complementary markets are already competitive in their own right. Extending unbundling into these markets is, therefore, not only unnecessary to assure continued competition in those markets, but also likely to undermine the competitive supply of facilities that already has emerged for the local inputs in these markets.

1. Conversion of Special Access Circuits to UNEs.

"Special access" is the name given to "a variety of services and facilities which constitute the local portion of certain interstate telecommunications lines."[64] Special access "primarily involves the provisioning of so-called 'private lines,' that is, facilities or network transmission capacity dedicated to the use of an individual customer."[65] These dedicated facilities typically "run directly between the end user and the [interexchange carrier's] point of presence (POP),"[66] or directly between two end-user locations. When ILECs provide special access circuits to interexchange carriers, the ILECs must typically build those circuits from the ground up, using a combination of local loops and interoffice transport.

The customers for special access "are IXCs and large businesses, not residential or small business end users."[67] In fact, between 78 and 89 percent of the special access revenue earned

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(Jan. 21, 2002) (Cavalier Telephone acquired the assets and customer lines of Net2000 in Virginia, Maryland, and Washington, D.C.; Broadview will acquire Net2000's assets in New York and Boston).

[62] *See, e.g.*, J. Borland, *AT&T Buys NorthPoint Assets*, CNET News.com (Mar. 22, 2001), http://news.com.com/2100-1033-254629.html?legacy=cnet ("AT&T is not taking over NorthPoint's customers along with the network.").

[63] *UNE Remand Order* ¶ 5 ("We continue to believe that the ability of requesting carriers to use unbundled network elements, including various combinations of unbundled network elements, is integral to achieving Congress' objective of promoting rapid competition to all consumers in the local telecommunications market."); *id.* ¶ 9 ("The unbundling standards we adopt in this Order [] seek to encourage the rapid introduction of competition in all markets.").

[64] *Investigation of Special Access Tariffs of Local Exchange Carriers*, 8 FCC Rcd 4712, ¶ 2 (1993).

[65] *Id.*

[66] *Pricing Flexibility Order* ¶ 8.

[67] *Pricing Flexibility Order* ¶ 142. *See also WorldCom v. FCC*, 238 F.3d. 449, 453 (D.C. Cir. 2001) ("Most users of special access services are companies with high call volumes."); Corrected Brief for Federal Communications Commission at 4, *WorldCom v. FCC*, No. 99-1395, *et al.* (D.C. Cir. filed Sept. 12, 2000) ("Because special access services employ dedicated facilities, special access is typically used by IXCs and large businesses with high traffic volumes."); Brief of MCI WorldCom, Petitioners and Supporting Intervenors at 3-4, *WorldCom v. FCC*, No. 99-1395, *et al.* (D.C. Cir. filed Sept. 8, 2000) ("Special access, used generally by business customers who have a high volume of

by BellSouth, Qwest, SBC, and Verizon is generated from DS-1 circuits or above (*e.g.*, DS-3, OC-3).[68] And as the Commission has recognized, DS-1 circuits "are primarily used by business customers."[69]

The largest purchasers of special access service are interexchange carriers, which use special access to transport large volumes of traffic to and from their largest business customers.[70] Between 56 and 76 percent of the special access revenue earned by BellSouth, Qwest, SBC, and Verizon is generated by interexchange carriers. The Commission has noted that long distance carriers "typically provide resold special access and private line services as part of toll service operations."[71]

Special access traffic is also highly concentrated, geographically. In each of the BOC regions, the vast majority of special access revenue is generated in a very small minority of wire centers.[72]

The special access market is already highly competitive. It was among the first to be opened to competition, and it has attracted large numbers of competitors because of the extremely large traffic volumes that it involves. The only economic argument for permitting the

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calls, is accomplished 'via a private, dedicated line...running from the customer to the IXC' . . . By contrast, switched access connections are generally used by residential customers and other customers with lower traffic volumes.") (internal citations omitted).

[68] USTA, *Competition for Special Access Service, High-Capacity Loops, and Interoffice Transport*, CC Docket No. 96-98, at 2 & Table 1 (FCC filed Apr. 5, 2001).

[69] *See, e.g.*, *Second Advanced Services Report* ¶ 99.

[70] The big three interexchange carriers are not only the largest purchasers of special access service from incumbent LECs, but also major self-suppliers of special access. AT&T and WorldCom, for example, each has local facilities in approximately 100 markets that likely are used to provide special access services. *See NPRG CLEC Report 2002, 15th ed.*, Ch. 6 – WorldCom at 13, 18 & AT&T at 19, 24. Sprint has stated that it is deploying local fiber rings in "20 major U.S. markets" that allow "improved access economics," and enable Sprint "to significantly reduce its special access costs." Sprint News Release, *Sprint Announces Financial Targets and Growth Strategies* (Nov. 3, 2000). Other long distance providers – including Williams, Level 3, and Global Crossing – likewise have extensive local facilities that they use to self-provide special access services. *See, e.g.*, C. Grice, *Williams to Expand High-Speed Network into 50 Cities*, News.com (Feb. 10, 2000), http://news.cnet.com/news/0-1004-200-1546995.html?tag=st (Williams "expects to spend $421 million over three years in order to link its proposed 33,000-mile fiber-optic 'backbone' network directly to business customers in the nation's largest cities."); Level 3 Communications, *The Level 3 Network*, http://www.level3.com/673.html (Level 3 has 57 markets in service and almost 16,000 miles of conduit in North America); Global Crossing Press Release, *Global Crossing Reports 2000 Pro Forma Cash Revenue up 36%, Recurring Adjusted EBITDA up 54% from 1999* (Feb. 14, 2001) (in 2000, Global Crossing completed metro rings in 10 cities in the United States: New York, Philadelphia, Washington D.C., Atlanta, Miami, Dallas, Chicago, San Francisco, San Jose, and Los Angeles).

[71] FCC, *Local Telephone Competition at the New Millennium* at Table 6, note **** (Aug. 2000).

[72] More than 80 percent of SBC's special access revenues are generated in less than 25 percent of the wire centers in which it is providing special access. In Verizon's region, more than 80 percent of special access revenues are generated from about 20 percent of Verizon's total wire centers. In Qwest's region, more than 60 percent of special access revenues are generated from 11 percent of Qwest's total wire centers. In BellSouth's region, 91 percent of special access revenues are generated from 20 percent of BellSouth's total wire centers. USTA, *Competition for Special Access Service, High-Capacity Loops, and Interoffice Transport*, CC Docket No. 96-98, at 3 (FCC filed Apr. 5, 2001).

conversion of special access circuits into UNEs is that it would supposedly reduce the costs of the inputs that interexchange carriers use in the provision of long distance services. But as the Commission has recognized, the long distance market already is competitive for large business customers that are the primary end-users served with special access circuits.[73] Any regulatory action that merely reduces the prices that one of the competitive suppliers of special access may charge is, therefore, unnecessary to promote long distance competition.

Any such action would devalue the assets of other competitive suppliers in this market. CLECs as a group are more significant suppliers of special access service than basic local exchange service. As the Commission has found, "the revenues of competitive LECs come primarily from special access and local private line services."[74] CLECs now account for between 28 and 39 percent of all special access revenue, *see* Appendix L, which is significantly larger than their share of the local exchange market as a whole.[75] CLECs have obtained fiber-based collocation in wire centers that contain a significant share of BOC special access revenues.[76]

2. Conversion of Transmission Services for Wireless Carriers.

Some wireless carriers suggest that CMRS base stations are equivalent to ILEC end offices, and that wireless carriers are therefore entitled to buy "interoffice transport," at UNE rates, between various points on their networks.

Wireless carriers clearly do not need access to transport UNEs to compete in wireless markets themselves. The 1996 Act authorized ILEC wireless affiliates to enter long-distance markets immediately, without waiting for any unbundling or section 271 checklist approval by their wireline affiliates.[77] As the Commission's sixth annual report ("*Sixth CMRS Report*") on competition in Commercial Mobile Radio Services (CMRS) concluded in December 2001, U.S. wireless markets are robustly competitive, and growing more so year by year.[78] While ILEC

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[73] *See Revisions to Price Cap Rules for AT&T Corp.*, Report and Order, 10 FCC Rcd 3009, ¶¶ 16-18 (1995); *see also Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier*, Order, 11 FCC Rcd 3271, ¶¶ 88-90 (1995).

[74] *See, e.g., Promotion of Competitive Networks in Local Telecommunications Markets*, First Report and Order and Further Notice of Proposed Rulemaking in WT Docket No. 99-217, Fifth Report and Order and Memorandum Opinion and Order in CC Docket No. 96-98, and Fourth Report and Order and Memorandum Opinion and Order in CC Docket No. 88-57, 15 FCC Rcd 22983, ¶ 24 (2000).

[75] *See* Section I.D.

[76] *See* USTA, *Competition for Special Access Service, High-Capacity Loops, and Interoffice Transport*, CC Docket No. 96-98, at 6-7 (FCC filed Apr. 5, 2001) (In 183 of the 320 MSAs served by BellSouth, Qwest, SBC, and Verizon, one or more fiber based collocation arrangements existed in wire centers that cover at least 30 percent of the incumbent LECs' special access revenues in those MSAs. In 154 of these MSAs, one or more collocation arrangements exist in wire centers that cover at least 65 percent of the incumbent LEC's special access revenues in those MSAs.).

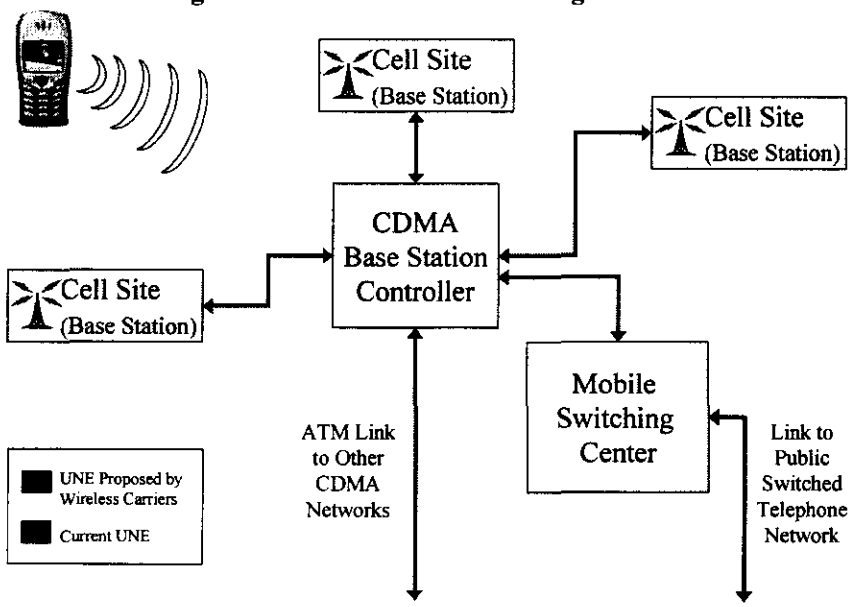
[77] 47 U.S.C. § 271(g)(3).

[78] *See, e.g., Sixth CMRS Report* 4-5 ("In the year 2000, the CMRS industry continued to experience increased competition and innovation as evidenced by lower prices for consumers and increased diversity of service offerings."). The Commission cited that the "continued downward price trends, churn, and continued expansion of mobile networks

affiliates rank as robust competitors in wireless markets, unaffiliated wireless carriers are more than holding their own. Approximately 40 percent of the wireless market is served by carriers that are not affiliated with any ILEC.[79]

Wireless networks consist of four basic tiers. *See* Figure 4.[80] The first three tiers define the *wireless* tier of the wireless carrier's network; the fourth tier both switches wireless calls and hands them off to and from the wireline network.[81] All of the true switching is performed at the fourth level.

Figure 4. CDMA Network Configuration



The base station is not a switch – its purpose is to allocate a shared resource – wireless bandwidth – among multiple users of the network who aren't all using their wireless phones at the same time. It is the *mobile switching center* – not the base station itself – that orchestrates the intra-switch hand off when a user moves away from base station A and toward base station B. And likewise for the hand-off required when the user moves on toward a more distant base station C, which is connected to an entirely different switch. The switches themselves are linked to an ATM network that is there to support these "soft," inter-switch handoffs of live calls. The base station plays no more role in orchestrating the hand off than the wireless handset does – all of these tiers of the network remain under the direction and control of the switch. And in any

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into new and existing markets demonstrate a high level of competition for mobile telephony customers. . . . Most carriers report churn rates between 1.5 percent and 3 percent per month. . . . According to one recent survey, almost one in five wireless subscribers have switched carriers in the past year." *Sixth CMRS Report* at 21, 23.

[79] *See Legg Mason Wireless Industry Scorecard* at Exh. 8 (estimated market share as of 3Q 2001).

[80] *See* Nortel Networks, *Products and Services, CDMA Networks*, http://www.nortelnetworks.com/products/01/cdma/index.html#.

[81] *See* Nortel Networks, *The DMS-100 Wireless System* at 3, Document No. 50171.16/10-97 Issue 1.