COMPETITIVE TELECOMMUNICATIONS ASSOCIATION

ADVANCING GLOBAL COMMUNICATIONS THROUGH COMPETITION

1900 M STREET, NW, SUITE 800
WASHINGTON, DC 20036-3508
PH: 202.296.6650
FX: 202.296.7585
www.comptel.org

CompTel®

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Via Electronic Filing

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *CC Docket Nos. 01-338, 98-147, and 96-98*

Dear Ms. Dortch:

The Competitive Telecommunications Association ("CompTel") has demonstrated that competitive carriers have made tremendous investments in fiber facilities in the period subsequent to enactment of the Telecommunications Act of 1996.[1] These fiber facilities can, indeed, be the foundation for many new, innovative, and dynamic telecommunications-based services to American business consumers. The rapid deployment of these services would fully and efficiently utilize existing fiber investment; however, this will not result unless the Commission allows competitors to dramatically expand last mile transmission capacity by using the idle, existing, excess capacity of the ILECs. Only by enabling competitive carriers greater use of the dark fiber UNE, and clarifying the unrestricted terms on which this facility must be made available, can the Commission further its professed goals of stimulating equipment investment and facilities deployment while adding critical bottleneck capacity and "unstranding" the country's massive amounts of poorly utilized local, metro, and long-haul fiber capacity.[2]

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[1] CompTel estimates that over $25 billion in optical network related capital expenditures has been invested by new, primarily local metro, optical carriers since the inception of the Act. See attached CompTel CapEx Report, pp. 10-13. This estimate does not include optimization of traditional IXC/CLEC networks with fiber technology, which would likely comprise a substantial portion of the over $60 billion that these carriers spent due to investment incentives created under the Act. *Id*. at 2.

[2] *See, e.g., In the Matter of the Investigation Into US West Communications, Inc.'s Compliance With § 271 of the Telecommunications Act of 1996*, 2001 Colo. PUC LEXIS 716 at 13, Decision No. R01-846; Docket No. 97I-198T (August 16, 2001) ("In essence, the addition of electronics to unlit fiber constitutes the construction of *a new, 'functional' dedicated transport facility*. . . .") (emphasis added)

In the present proceeding, the Commission has the opportunity to stimulate the purchase of optical equipment and to remove a potent obstacle to greater fiber deployment: the ILECs' ability to use their bottleneck control over critical inputs to reduce the value of other carriers' investment. The ILECs' ability and incentives to restrict output in loop and transport facilities by warehousing ratepayer-funded excess capacity is not only a possible outcome, but a certain one if the ILECs are allowed to limit optical carriers— who own and operate vast fiber networks capable of providing service at speeds up to OC192—to DS1 or DS3 level facilities for the last mile. Further, by restricting access to their excess fiber capacity, the ILECs will force competitive carriers to rely on ILEC UNEs (where available) and BOC special access services for both loop and transport functionalities. Thus, until it eliminates the ability of the last mile "tail" to wag the "dog" of redundant optical networks, the Commission will be frustrated in its ability to implement the twin goals of stimulating competition and refraining from regulation.

Use of the Dark Fiber UNE By Requesting Carriers

Carriers requesting ILEC dark fiber generally own and operate their own fiber optic networks. These networks consist of fiber routes they have constructed and have deployed either through municipal rights-of-way, or the leasing of poles, ducts, and conduits from the owner of those facilities. These carriers "light" the fiber by deploying optical electronics ("optronics") equipment at both ends of the dormant, or "dark," fiber. In providing optical network services, carriers are able to offer many telecommunications services to their customers that are cheaper and are superior in terms of bandwidth capacity, reliability, and transmission provisioning performance than those services typically available from incumbent carriers. This superior performance comes at substantial cost to these carriers, as the optronic equipment that they must deploy is easily the single most expensive part of a metro optical network--regardless of whether the fiber they are lighting is their "own" or leased from the ILEC.[3]

These carriers provide very high bandwidth transmission capacity at very high levels of transmission quality, reliability, and redundancy. Given the previously noted expense of deploying optical capacity, these carriers must gain a significant amount of traffic quickly within their chosen geographic market. To this end, an optical network provider will first seek to gain traffic from the natural points of local aggregation within other carriers' networks. Wholesale metro transport services are required by CLECs, IXCs, ISPs, CMRS providers, and satellite providers for the transmission of data, voice, and video signals. As a natural extension of providing wholesale service to carriers, optical network service providers will also frequently be best positioned to serve very high traffic retail customers; for example, providing private networks for large institutions. Similarly, many carriers offering a full complement of retail telecommunications services

[3] See, Letter from Scott Sawyer, Conversent Communications, to Marlene H. Dortch, FCC, dated January 10, 2003, pp. 4-6 (explaining the additional costs per lit fiber span to provide lit capacity using dark fiber vs. purchasing capacity already lit by the ILEC).

will provide these services over optical networks. This is because optical networks allow carriers to distinguish themselves by providing superior customer service, through features such as the ability to provision bandwidth dynamically, and superior reliability.

Wholesale Metro Transport Service Providers Are "Telecommunications Carriers" Providing a "Telecommunications Service"

During a recent meeting, FCC staff asked CompTel to comment on whether wholesale providers of transmission services are "telecommunications carriers" seeking UNEs to provide a "telecommunications service." As a matter of both law and Commission precedent, wholesale providers of transport services are entitled to UNEs under Section 251(c)(3). CompTel is aware that incumbents have, on occasion, argued that telecommunications is not "telecommunications service" if that service is provided to any customers other than retail "end users."

As an initial matter, Section 251(c)(3) of the Act requires ILECs to provide requesting telecommunications carriers access to UNEs for the provision of telecommunications services, and the FCC's rules make clear that the ILEC "shall not impose limitations, restrictions, or requirements on requests for, or the use of, unbundled network elements that would impair the ability of a requesting telecommunications carrier to offer a telecommunications service in the manner the requesting telecommunications carrier intends."[4] The Act defines "telecommunications service" as the "offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used."[5]

For example, "exchange access" service (a service sold on a wholesale basis to other carriers) is classified by the FCC as a telecommunications service.[6] Although other carriers purchase the great bulk of exchange access services, those services are certainly offered to "the public." Indeed, telecommunications carriers, along with other large users, clearly are a subset of "the public." By arguing that "the public" cannot include other common carriers, one would have to argue that a wholesale carrier cannot be a "telecommunications carrier" within the meaning of Section 251(c)(3).

However, the FCC has thus far interpreted the term "telecommunications carrier" as essentially synonymous with the term "common carrier" used in the 1934 Act.[7] The

[4] 47 CFR §51.309(a).

[5] 47 U.S.C. §153(46).

[6] Local Competition Order, ¶ 356.

[7] *AT&T Submarine Sys., Inc.*, 13 F.C.C.R. 21585 ¶ 6 (1998) ("[T]he term 'telecommunications carrier' means essentially the same as common carrier."); *accord In the Matter of Cable & Wireless, PLC Application for a License to Land and Operate in the United States a Private Submarine Fiber Optic Cable*, 12 F.C.C.R. 8516 ¶¶ 12-13 (1997). No court to date has independently interpreted the statute, however. While the D.C. Circuit has held that the Commission's interpretation is a permissible construction, it has noted that the terms "telecommunications carrier" and "common carrier" are "not necessarily identical," and has reserved the question of what differences exist between the two terms. *Virgin*

Telecommunications Act defines a common carrier as "any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio."[8] The D.C. Circuit has read that concededly circular definition to reflect the common law of carriers.[9] Accordingly, based on the history of common-carriage laws, the D.C. Circuit has defined a common carrier as an entity that "undertakes to carry for all people indifferently."[10] The court explained that this definition

> does not mean that a given carrier's services must practically be available to the entire public. One may be a common carrier though the nature of the service rendered is sufficiently specialized as to be of possible use to only a fraction of the total population.[11]

Therefore, it is difficult to see how, under any interpretation of the plain language of Section 251(c)(3), a wholesale carrier is not a "telecommunications carrier" entitled to use ILEC UNEs to provide a telecommunications service to any customer, or class of customers, that may find such service useful. Moreover, metro area transport services are clearly transmission services offered for a fee to the public.

Dark Fiber Is A Unique Product Market

For purposes of defining product and geographic markets, the FCC has adopted the framework used in the Horizontal Merger Guidelines used by the Department of Justice and the Federal Trade Commission.[12] As the Guidelines note, "[m]arket definition focuses solely on demand substitution factors--i.e., possible consumer responses."[13] Therefore, when examining dark fiber as a wholesale input, it is clear that from the consumer's perspective (here, the wholesale carrier) that lit fiber transport (from either an

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Islands Telephone Corp. v. FCC, 198 F.3d 921, 927 (D.C. Cir. 1999), *aff'g AT&T Submarine Sys.*, 13 F.C.C.R. 21585.

[8] 47 U.S.C. §153(10).

[9] *Nat'l Ass'n of Regulatory Util. Comm'rs v. FCC (NARUC I)*, 525 F.2d 630; *Nat'l Ass'n of Regulatory Util. Comm'rs v. FCC* (*NARUC II*), 533 F.2d 601 (D.C. Cir. 1976).

[10] *NARUC I*, 525 F.2d at 641 (internal quotation marks and citations omitted).

[11] *Id.*

[12] *See Regulatory Treatment of LEC Provision of Interexchange Services Originating in the LEC's Local Exchange Area; Policy and Rules Concerning the Interstate, Interexchange Marketplace*, Second Report and Order in CC Docket No. 96-149 and Third Report and Order in CC Docket No. 96-61, 12 FCC Rcd 15756, ¶ 26 (1997) ["ILEC Interexchange Classification Order"] ("We conclude that we should revise our product and geographic market definitions to follow the approach taken in the 1992 Merger Guidelines.")

[13] Guidelines, Section 1.0.

ILEC or competitive carrier) is not a substitute for dark fiber, and competitive dark fiber is not a comparable substitute for ILEC dark fiber.[14]

As an initial matter, a carriers' carrier, or "critical needs" retail carrier, will typically have to guarantee a very high level of service quality and commit to the payment of liquidated damages, or future bill credits, if these service levels are not met. These contract performance commitments are known as "service level agreements," or "SLAs." The service levels required under these SLAs may well exceed any minimum performance guarantees that exist under existing ILEC inter/intrastate access tariffs, or state-specific UNE performance standards for equivalent transmission UNEs such as loops or transport.[15] Correspondingly, the consequential damages likely to be suffered by carrier or "critical needs" customers (and, thus, the contractual liquidated damages, or foregone revenue in the case of bill credits) well exceed any comparable refunds or payments that are available in either access tariffs or under state UNE performance assurance plans.[16] It is, therefore, of paramount importance that an optical network service provider be able to control, to the extent possible, the performance and reliability of its network. Such control extends not only to the deployment and maintenance of its own optical equipment, but also to the ability to monitor the performance of that equipment 24 hours/day, 7 days/week. Thus, the interoperability of dark fiber with an optical carrier's existing optronics and network management equipment, and the corresponding level of network performance and control that dark fiber affords, make dark fiber a UNE with properties that are uniquely valuable to optical network services providers.

It is also notable that, from the requesting carrier's perspective, there are very few adequate substitutes for ILEC dark fiber. This is because almost no other carriers sell dark fiber in the same manner as the ILEC. First, of the limited number of competitive transport providers that may be available to provide wholesale inputs to retail CLECs, very few of these carriers also provide wholesale inputs (*i.e.*, dark fiber) to other wholesale carriers. In other words, many of the competitors who offer transport on a wholesale basis along certain routes (*e.g.*, AT&T, WorldCom, and XO Communications) are vertically integrated retail CLECs offering their own excess capacity lit transport to other retail CLECs. CompTel is not aware of any of these carriers providing access to their dark fiber to wholesale carriers.

Second, while carriers who specialize in the wholesale market (*e.g.*, Dominion Telecom, FPL Fibernet, NEON Communications) will often make both dark and lit fiber services available to other wholesale providers, they typically do not sell dark fiber on the

[14] *See* Declaration of Pantios Manias, El Paso Global Networks (attached) ["*Manias Declaration*"] ¶¶ 7-10.

[15] *Id.* at ¶¶ 9-10.

[16] *Id.*

same "route" basis as they sell lit fiber transport services. Additionally, competitive fiber purchasers usually want the ability to provide redundant routing on dark fiber and this capability would be lost if the fiber were offered on a route, or point-to-point, basis. On the other hand, the ILEC network topology is a more hierarchical design, relying significantly on point-to-point fiber routes. The ILECs insert planned break points, or gaps, in their point-to-point network configuration. These allow the ILEC to use "just in time" splicing to create unique routes that efficiently utilize its network design.[17] Thus, the ILEC's scale and scope economies allow it to efficiently use a network design that would be inefficient for competitors with less traffic.

A Transmission Path Between Two Points Is the Proper Geographic Market

Again, as in our product market analysis, to define the proper geographic market for dark fiber, the Commission must consider the alternatives from the perspective of the purchaser—in this case, the requesting carrier. Because the ultimate functionality that the requesting carrier will provide will be the transmission of traffic along two points in the network (through the application of the requesting carrier's own equipment), dark fiber must be available between the relevant two points. The Commission has previously recognized that telecommunications markets are essentially point-to-point markets.[18] This is especially true with respect to the type of dedicated transmission services that optical carriers provide to their customers.

However, it must be acknowledged that even though a given A to Z route is the proper limitation of a geographic market, the minimum geographic scale of entry will probably require entry into multiple geographic markets in any given area, and will vary depending on the economies of density that the carrier can achieve on deployed fiber. For each metropolitan area serviced by the carrier, entry at minimum viable scale is the ability to address a substantial portion, if not all, of the routes to and from ILEC, IXC, CLEC, CMRS, and ISP traffic aggregation points within this metropolitan area. An optical carrier must also be able to address all buildings that may generate a high amount of data or voice traffic. Additionally, in order to be able to effectively serve these high traffic routes, a carrier must often be able to also provide services to customer premises that are not along high traffic routes, and many times can only be cost justified though the use of the ILEC UNEs.

Proposed Dark Fiber UNE Definition and Description

[17] *See* Letter from Stephen W. Crawford, El Paso Networks, and Scott Sawyer, Conversent Communications, to Marlene H. Dortch, FCC, dated November 26, 2002 ["*El Paso/Conversent Ex Parte*"] at 3.

[18] *See* ILEC Interexchange Classification Order at ¶ 64 (FCC defines a "relevant geographic market for interstate, domestic, long distance services as all possible routes that allow for a connection from one particular location to another particular location (i.e., a point-to-point market).")

The existing definition of dark fiber as merely another high capacity subset of the loop or dedicated interoffice transport UNEs does not completely and accurately describe this UNE's functionality within *all* of the commercial, technical, and operational considerations relevant to the deployment of optical telecommunications networks. Rather, the existing UNE definitions of "loop" and "dedicated interoffice transport" are more relevant within the context of the traditional hierarchical ILEC network architecture. Therefore, while dark fiber as a UNE subset of loops and transport is an accurate way of conceptually defining the UNE functionality for many requesting carriers, it does not cover all of the uses for which a requesting carrier may require the dark fiber UNE.

For example, in an optical network configuration, as noted above, it is more appropriate simply to consider transmission along a path as the relevant functionality that an optical network service provider would be requesting. Optical network service providers typically use fiber transport to provide either a "backbone" (referring to transmission of aggregated traffic) transmission functionality and /or "last mile" (distribution) functionality. The underlying transmission functionality is the same from both an operational and technical provisioning perspective, regardless of the purpose (distribution or aggregation) to which the functionality is being applied.

Thus, in addition to the existing definitions of dark fiber as a subset of the loop and transport UNEs, dark fiber can also be appropriately defined as unlit fiber which, when spliced to provide an uninterrupted transmission path between two points and lit through the application of optical equipment, has the capability of transmitting telecommunications, directly or indirectly, to or from its ultimate point of termination. Accordingly, the dark fiber UNE is defined[19] as follows:

1) Fiber within the ILEC network that is not currently lit or carrying traffic;
2) Any necessary splicing of the fiber to create a continuous optical transmission path from any point on the ILEC network to interconnection with the requesting carrier's lit fiber network, or from any point on the ILEC network to a point of termination on the ILEC network, without regard to whether the requesting carrier is collocated in each central office traversed by the fiber path identified;
3) Natural points of dark fiber interconnection necessarily include existing splice cases;
4) Access to the same information about the availability and condition of ILEC dark fiber that is available to any ILEC employee or agent;
5) Dark fiber can be used by the party lighting the fiber to provide any service that fiber is capable of supporting, as long as the requesting carrier is also using the dark fiber UNE to provide a telecommunications service.

[19] This definition is completely consistent with the definition proposed by El Paso and Conversent, which CompTel fully supports. *See El Paso/Conversent Ex Parte* at 9-10.

Conditions Under Which Carriers Are Impaired Without Access to Dark Fiber

As a matter of general construction, it can be said that requesting carriers are "impaired" without access to a non-proprietary ILEC UNE when access to the requested UNE is not competitively available from a reasonable number of alternative sources other than the ILEC network and the construction of redundant facilities is not economically justified.[20] Consistent with the purpose of the Act—to promote competition, reduce regulation, reduce prices and increase quality of telecommunications services, and to encourage the rapid deployment of new telecommunications technologies—the Commission should adopt objective limiting principles around whether access to the UNE is likely to be a critical factor in the requesting carriers' decision to enter the market. In other words, if the absence of the UNE would be properly classified as a "barrier to entry" to any properly defined product or geographic market, then the requesting carrier is "impaired" without access to the non-proprietary UNE and the UNE is appropriately required to be made available.[21] Said differently, if a carrier can enter the product and geographic market it seeks to serve without access to the ILEC UNE--considering its likely costs of capital, sunk costs of investment,[22] time to enter, and likely expected annual sales--and become cash-flow positive within a reasonable time period (*e.g.*, two years), then the carrier is not impaired without access to the requested functionality.[23]

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[20] *See e.g., AT&T v. Iowa Utilities Board*, 525 U.S. 366, 389 reversing the Commission's interpretation of Section 251(d)(2) for excluding from its analysis of mandatory UNE availability a "comparison with self-provision[] or with purchasing from another provider."

[21] For thorough discussion of how the impairment test under the Act should incorporate, and reflect, generally-recognized barriers to entry, see the submission by Professor Robert Willig, dated November 15,2002 submitted as an attachment to the letter from Joan Marie Marsh, AT&T to Marlene Dortch, FCC, CC Docket Nos. 01-338, 96-98,98-147, November 15, 2002 ["*Willig Impairment Ex Parte*"]. Professor Willig explains that a useful analytical framework for considering the likelihood competitive entry, and how various market characteristics act as barriers to entry, is described in the DoJ/FTC Horizontal Merger Guidelines. Examples of entry barriers include proportionately large sunk costs, economies of scale and scope, high minimum viable scale, and disparate cost disadvantages faced by entrants with respect to incumbent carriers.

[22] The existence of high, or proportionately high, sunk costs is generally recognized as a barrier to entry. *See, e.g.,* Larson, *An Economic Guide to Competitive Standards in Telecommunications Regulation*, 1 CommLaw Conspectus 31, 52 ("if entry requires the incurrence of capital costs, and a 'high' proportion of these are sunk costs for entrants, then entry barriers exist.") *c.f.*, Bolton, Brodley, and Riordan, *Predatory Pricing: Strategic Theory and Legal Policy*, 88 Geo. L.J. 2239, 2265 (August, 2000)("if challenged by new entry, the incumbent will rationally disregard such [sunk] costs in its pricing decisions rather than lose the business. The entrant . . . must now incur such costs, and therefore faces risk of underpricing by an incumbent with sunk costs. Thus, as a result, sunk costs may act as an entry barrier, giving the incumbent the ability to raise price above the competitive level.")

[23] This proposed analysis closely tracks the concept of "minimum viable scale" used by the Department of Justice and the Federal Trade Commission to evaluate whether competitive entry will likely constrain an anticompetitive exercise of market power following a merger of 2 rivals. DoJ Guidelines at 3.3. Specifically,

> Minimum viable scale is the smallest average annual level of sales that the committed entrant must persistently achieve for profitability at pre-merger prices. Minimum viable

Such an analysis is not only fully consistent with prevailing antitrust jurisprudence and economic theory regarding barriers to entry, as Professor Willig explains, but it is also fully consistent with the goals of the Act--encouraging competition through the elimination of barriers to entry.[24] Thus, impairment should reflect those features of the telecommunications market in question that can deter efficient entry. Simply put, if the lack of access to the UNE in question constitutes a barrier to entry, then it is appropriate considering the fundamental purpose of the Act for the Commission to remove that barrier to entry and require that access to the UNE be made available on the non-discriminatory terms required under Section 251(c)(3).

In his submission, Professor Willig describes in greater detail how the concepts of sunk costs and minimum viable scale should be applied in an impairment analysis under the Act. While sunk costs are generally recognized to constitute entry barriers where those costs comprise a substantial portion of the overall fixed costs of entry, there is likely to be little doubt as to the "sunk" (both literally, and economically, speaking) nature of costs associated with the deployment of fiber facilities. Experience has shown that if the carrier deploying the fiber fails to succeed in the market, the cost of the fiber will be largely unrecoverable on the secondary market.[25] Similarly, while the concept of minimum viable scale can seem somewhat difficult to apply in the abstract, with respect to the dark fiber UNE, there is only one feature the Commission must consider to determine that minimum viable scale is so high that it constitutes a barrier to entry—whether competitive entrants can enter at the same costs as the incumbent.

> scale is a function of expected revenues, based upon pre-merger prices, and all categories of costs associated with the entry alternative, including an appropriate rate of return on invested capital given that entry could fail and sunk costs, if any, will be lost."

1992 Merger Guidelines, § 3.3. Footnote 31 to Section 3.3 provides additional gloss on minimum viable scale that attempts to define an unacceptably high barrier to new entry:

> The minimum viable scale of an entry alternative will be relatively large when the fixed costs of entry are large, when the fixed costs of entry are largely sunk, when the marginal costs of production are high at low levels of output, and when a plant is underutilized for a long time because of delays in achieving market acceptance. "

1992 Merger Guidelines, § 3.3 n.31. The notion of minimum viable scale has also been relied upon to analyze entry barriers in the context of evaluating potential anticompetitive effects of an alleged vertical restraint. *See Coventry Health Care of Kansas v. Via Christi Health System*, 176 F. Supp. 1207 (D. Kan. 2001) (using minimum viable scale analysis to analyze antitrust challenge to exclusive contract).

[24] *Accord Verizon v. FCC*, 1622 S.Ct. 1646, 1668, n.20 (2002) ("a policy promoting lower lease prices for expensive facilities unlikely to be duplicated *reduces barriers to entry* . . . .")(emphasis added)

[25] Global Crossing's assets, for example, were valued at only 1 penny on the dollar by investors at its bankruptcy auction. "*Surviving the Fiber-Optic Fire Sale*," Wired Magazine, Issue 10.11. November 2002. Available at www.wired.com/wired/archive/10.11/fiber_optic_pr.html.

Professor Willig explains that even if prices are sufficient to trigger entry, a competitor "cannot expect to be successful over the long term unless it enters at costs comparable to the incumbent's, because it will always face a significant risk that the incumbent will ultimately choose to lower its prices toward its costs."[26] Importantly, the ILEC's ability to price discriminate in special access markets where they have pricing flexibility requires prospective entrants into wholesale transport markets to regard this "risk" (that prices will be selectively, and strategically, reduced to the incumbent's incremental cost, or lower) as a near certainty.[27]

Indeed, in an *ex parte* presentation in this docket, WorldCom introduced an analysis demonstrating that the ILECs have established pricing structures which place the bulk of their supracompetitive profits in the distance-sensitive component of their special access prices.[28] WorldCom explains that, for each special access circuit, there is a fixed "facilities" charge and a distance-sensitive mileage component. In comparing special access versus UNE prices, WorldCom observes "[i]t is noteworthy that, for DS3s, the fixed special access charge is, on average, lower than the fixed UNE charge."[29] This point is indeed "noteworthy" because low-mileage, dense urban routes are precisely those where one would expect that competitive facilities-based entry would occur. The net effect, in terms of minimum viable scale analysis, is that "[w]here an entrant has significantly higher costs than the incumbent providers' price, its minimum viable scale is effectively infinity."[30]

Furthermore, it is well established that in considering the expense of undertaking the new construction of competitive fiber facilities (both backbone and last mile), the competitive carrier will confront costs not borne by the incumbent carrier. For example, the ILEC likely secured its initial access to both rights-of-way[31] and commercial

[26] *Willig Impairment Ex Parte* at 7.

[27] It is this ability to price discriminate that compels the Commission to undertake a precise rout-specific impairment analysis for both dark fiber and lit transport services, and prevents the Commission from adopting a wider market area/market share analysis. This is because with the ability to price discriminate, a competitive facility on any given route could not possibly constrain the ability of the monopolist on other routes to exercise its market power on those monopoly routes. See Guidelines, § 1.22 ("if a hypothetical monopolist can identify and price differently to buyers in certain areas . . . who would not defeat the targeted price increase by substituting to more distant sellers in response to a . . . price increase for the relevant product, and if other buyers likely would not purchase the relevant product and resell to targeted buyers, then a hypothetical monopolist would profitably impose a discriminatory price increase. [In such cases],[t]he Agency will consider additional geographic markets consisting of particular locations of buyers for which a hypothetical monopolist would profitably and separately impose at least a "small but significant and nontransitory" increase in price.")

[28] Letter of Henry G. Hultquist, WorldCom, to Marlene H. Dortch, FCC, dated October 29, 2002, CC Docket Nos. 96-98, 98-147, 01-338, pp. 6-8.

[29] *Id.* at 7.

[30] *Willig Impairment Ex Parte*., n.20.

[31] *See generally*, Day, *The Concrete Barrier at the End of the Information Superhighway: Why Lack of Local Rights-of-Way Access Is Killing Competitive Local Exchange Carriers*, 54 Fed. Comm. L.J.

buildings[32] on more favorable terms than subsequent entrants can expect to obtain. Moreover, the TELRIC methodology makes it likely that in many instances the ILEC already will be recovering many of its sunk costs from its existing loop and transport UNE rates.[33]

Therefore, economically efficient investment in alternative fiber facilities is most likely to occur only on the most capacity constrained, and underserved, transmission paths. Because ILEC dark fiber is, by definition, excess capacity, a new entrant would not be likely to enter a market by adding duplicative capacity to existing routes. Rather, a new optical carrier entrant will first seek to deploy fiber over transmission paths that are most likely to have unique value to prospective customers.

In the case of dark fiber, requiring the ILEC to provide competitors access to this UNE will eliminate many clear and uncontested barriers to entry and will facilitate broadband supply competition through the addition of capacity to the competitive telecommunications input market. Leasing unused, "sunk" fiber from the ILEC allows a requesting carrier to avoid wasteful deployment of facilities where excess capacity (by definition) already exists. Moreover, as the trend toward both competitively and technologically driven line loss accelerates,[34] any opportunity cost imposed by an unbundling obligation becomes negligible. Further, the extension and augmentation of a carrier's network through dark fiber leasing allows the carrier to avoid the delays in time to market and expense of deployment not absorbed by the ILEC. In other words, the availability of ILEC dark fiber provides carriers with access to customers, and eliminates costs and delays that antitrust courts have traditionally found constitute economic barriers to entry.

For these reasons, the Commission should adopt a presumption that a carrier seeking access to ILEC dark fiber to light and interconnect with that carrier's own (or third-party leased) lit fiber or equipment is impaired without access to the dark fiber UNE. In a state arbitration, the ILEC could rebut this presumption by showing that the

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461 (May 2002). C.f., *TCG New York, Inc. v. City of White Plains,* 305 F.3d 67 (2d Cir. N.Y. 2002)(municipal ordinances imposing costs on entrants not borne by incumbents is a barrier to entry and subject to preemption under Section 253 of the Act). Moreover, as the Commission well knows, it can take years of litigation for entrants to obtain preemption rulings in an effort to compete on fair terms. Indeed, CompTel member City Signal Communications has had a petition for preemption pending with the Commission on this very issue for over 2 years. *Petition for Declaratory Ruling, City Signal Communications, Inc. v. City of Cleveland Heights*, CS Docket No. 00-253, filed October 18, 2000.

[32] See letter from Ruth Milkman, on behalf of WorldCom, to Marlene H. Dortch, FCC, dated October 25, 2002 (describing discriminatory terms vis-à-vis incumbents which competitors confront when trying to deploy high capacity facilities to commercial buildings).

[33] *See e.g., Verizon v. FCC*, 122 S. Ct. 1646, 1678 (2002) (Using an example of some of the inefficiencies built into TELRIC models, the Court explains that the NY PSC used an assumption of more expensive fiber based loops instead of more efficient copper loops in setting its TELRIC loop rates).

[34] See, *e.g.*, "*Access Line Count Evaporating*," Telephony, October 14, 2002, pp. 8-10.

requesting carrier would suffer no impairment in its ability to enter the market in question at minimum viable scale without access to the dark fiber UNE.

Deregulating Mandatory Access to Dark Fiber

CompTel has previously argued that a somewhat different test should be used to determine whether a CLEC would be impaired without access to "lit" dedicated transport on an unbundled basis.[35] The substantial sunk costs associated with the use of dark fiber supports distinguishing the impairment analysis for dark fiber transport from lit fiber transport. In the case of the retail CLEC using dedicated transport as a functionality, the CLEC's additional fixed and sunk costs of using an alternative transport provider are likely to be minimal—and proportionately comprise a smaller portion of the cost of the service sold at retail.

Allegiance Telecom, Inc. has proposed impairment tests for both lit and dark fiber interoffice transport that attempt to identify when the two aforementioned conditions – competitive availability of transport along a specific route and the elimination of barriers to self-deployment -- are satisfied.[36] With regard to dark fiber, the proposed test would eliminate the ILEC's unbundling requirements when two conditions are met: (1) two or more non-ILEC suppliers offer their own dark fiber on a wholesale basis on the point-to-point route on which a requesting carrier seeks unbundled dark fiber in volumes demanded by the requesting carrier or (2) three or more non-ILECs (regardless of whether they make the fiber available at wholesale or use it solely as an input into their own retail offerings) have deployed their own fiber on the point-to-point route.[37]

CompTel generally supports this test as a workable compromise that is consistent with the requirements of the Act and *USTA v. FCC*,[38] subject to some critical revisions and clarifications. The second prong of this test -- which considers dark fiber transport deployed by firms solely for their own use as a means to determine whether other carriers can self-provision facilities -- does not appropriately measure whether a competitor would

[35] Letter from H. Russell Frisby, Jr., CompTel, and John Windhausen, ALTS, to William F. Maher, Jr., Chief, Wireline Competition Bureau, FCC, dated October 8, 2002.

[36] Letter from Thomas Jones, Wilkie Farr & Gallagher, to Marlene H. Dortch, Federal Communications Commission, CC Docket Nos. 01-38, 96-98, 98-147 (January 30, 2003).

[37] *Id.*

[38] While CompTel does not take a position on Allegiance Telecom's proposed impairment test for lit transport, CompTel notes that this test – which counts the number of non-ILEC providers along a point-to-point route – will only be effective if the Commission eliminates all restrictions on the use of unbundled dark fiber by wholesale carriers. It is irrational for the Commission to count wholesale providers using dark fiber as non-ILEC alternatives for the purposes of evaluating the lack of impairment for lit transport services, and then impose restrictions on the use of dark fiber. If the Commission truly wants to achieve its dual goals of promoting deregulation and facilities-based competition, it must not impose restrictions that effectively prevent competitors from creating a robust wholesale market for critical inputs, especially when these restrictions prohibit the use of network capacity that would otherwise lie dormant.

be impaired without access to ILEC dark fiber under Section 251(d)(2)(B). The proposed rule is inherently flawed because it would count firms that purchase an indefeasible right of use ("IRU") for fiber originally deployed by another firm toward the three-firm requirement. Counting firms that utilize IRUs in no way identifies whether a competitor can overcome the inherent barriers to entry that impede its ability to self-provision facilities along a route. In fact, purchasing IRUs is a way to *avoid* significant entry barriers, including the cost of constructing a trench, obtaining rights-of-way and building access. Thus, the test should more appropriately examine whether multiple firms that have deployed their own dark fiber. This information can be used as evidence that construction costs do not serve as a barrier to self-deployment along a route. In contrast, the use of a single fiber facility by multiple carriers does not demonstrate that barriers to entry have been eliminated, and may in fact prove that such are barriers exist. Accordingly, CompTel believes that the second prong of the test should be revised to so it evaluates whether three or more non-ILEC carriers have *constructed* their own fiber along a point-to-point route.

CompTel also supports the clarifications proposed by member El Paso Global Networks' recent letter,[39] which argues that the Commission should require state commissions to find that CLECs are impaired without access to alternative providers of dark fiber transport along the entire route the CLEC seeks to serve, despite competitive alternatives on some portions of the larger route. Further, to the extent that a state commission finds that a competitive carrier is not impaired without dark fiber transport, a CLEC should have 12 to 18 months to transition from dark fiber UNEs, not the mere 6 months proposed by Allegiance.[40] As discussed by El Paso, commercial realities – obtaining rights-of-way and building access, constructing facilities, and turn-up and testing – regularly take at least one year to complete. This longer transition window will ensure that customer service is not negatively affected.[41]

* * *

As we have noted, establishing the ILEC's obligation to provide dark fiber should, consistent with the Act's purposes, be directly correlated to the requesting carrier's ability to *enter* a market. This interpretation is most consistent with the purposes of the Act not only because a profoundly anticompetitive consequence of impairment is that it constrains efficient competitive entry, but also because dark fiber is the UNE that offers the most promise of breaking the ILECs' bottleneck monopoly over critical upstream telecommunications inputs. It is this latter point that establishes the dark fiber UNE as

[39] Letter from Steven W. Crawford and Pantios Manias, El Paso Global Networks, to Marlene H. Dortch, Federal Communications Commission, CC Docket Nos. 01-338, 96-98, 98-147 at 6 (February 5, 2003).

[40] *Id.* at 7.

[41] *Id.*

consistent with the Act's deregulatory purpose. Because purchasers of the ILEC dark fiber UNE must, in order to get any utility out of the UNE, expend considerable sunk costs to light the fiber, they (as the Colorado Commission noted) functionally create a "new network." As a result of this substantial sunk investment, the competitive carriers using the dark fiber UNE always expand (many times, dramatically) the available capacity along the transmission paths they traverse. This expansion of output serves to constrain the primary source of market power (upstream) of the vertically-integrated ILEC, which in turn will allow the FCC and state regulators to be in a position to deregulate retail telecommunications services—with no corresponding loss of consumer welfare—sooner than would otherwise be the case.

Sincerely,

Jonathan D. Lee
Vice President,
Regulatory Affairs

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

In the Matter of	)	
	)	
Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers	)	CC Docket No. 01-338
	)	
Implementation of the Local Competition Provisions of the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147

DECLARATION OF PANTIOS MANIAS ON BEHALF OF EL PASO GLOBAL NETWORKS

The undersigned, being duly sworn on oath, does say and depose as follows:

1. My name is Pantios Manias. I am Senior Vice President for Carrier Relations, Regulatory and Business Development for El Paso Global Networks ("EPGN"). Prior to joining El Paso I worked for over four years at Southwestern Bell Telephone Company ("SWBT") in Texas. I began working at SWBT in 1996 as a Manager in the Network organization. In 1997 I moved to a position as a Special Access Account Manager selling Special Access to Wireless Carriers, and in my last position with SWBT I served as a CLEC Account Manager. My business address is 1001 Louisiana Street, Houston, TX 77002.

2. In my position at EPGN I am responsible for maintaining relations with the other telecommunications carriers, including incumbent LECs with whom EPN does business. For example, I am responsible for managing the negotiations of

interconnection agreements and the day to day interaction between EPN personnel and SWBT. I also have knowledge of EPN's relationship with its customers and am frequently involved in negotiating deals with customers that seek to obtain telecommunications services from EPN.

3. The Competitive Telecommunications Association ("CompTel"), of which EPGN is a member, asked me to provide this declaration for the purpose of explaining why wholesale telecommunications carriers, who use their own telecommunications facilities, still need access to ILEC facilities in the form of unbundled network elements—specifically dark fiber for the purposes of providing wholesale telecommunications services to other carriers. I will briefly describe EPGN and explain its business strategy. I will also explain why dark fiber is a UNE with unique value for facilities-intensive wholesale telecommunications carriers, and why purchasing "lit" transport services from the ILEC is, in most cases, not an adequate substitute for dark fiber loops and interoffice transport.

4. El Paso Global Networks, a subsidiary of the El Paso Corporation, is a combined facilities-based and UNE purchasing CLEC that provides high-speed telecommunications transport services to telecommunications carriers. To serve the needs of these customers, El Paso has deployed a state of the art transport network in five cities in Texas: Austin, San Antonio, Dallas, Houston and Fort Worth. El Paso has now completed its transport network, has collocated in most of SWBT's central offices in each of these five cities, and has connected these offices using dark fiber obtained from SWBT. El Paso is now focused on

attracting customers to its transport network. To reach these customers in a cost-effective manner, El Paso must have access to UNEs, including dark fiber loops, between El Paso's collocation arrangements in SWBT central offices and the customer's premises.

5. With over $400 million invested in equipment and collocation spaces in Texas, EPGN is a wholesale carrier whose customers provide business and residential voice and data services. As a wholesale carrier, EPGN provides transport to its customers, allowing them access to their switch or POP. To be successful, EPGN needs a footprint equal to or larger than its competitors, with the exception of SBC, in regards to access to the end user.

6. As a wholesale carrier, EPGN's strategy is to target customers with very high bandwidth capacity needs—primarily carrier customers. Carrier customers, which include competitive local exchange carriers, interexchange carriers, Internet service providers, and wireless carriers, all purchase bandwidth transport services.

7. All of EPGN's customers demand superior performance (as compared with the ILEC) in terms of network reliability, repair, and price. Our customers choose EPGN because we provide a "one-stop" source for transport within all of the major cities in Texas, a redundant network, and better quality service, better reliability, better repair intervals, and/or better pricing than the ILEC.

8. Because EPGN's customers place a premium on performance, it is critical that EPGN have complete control over its own network. In fact, in most instances, EPGN's customers demand—and our contracts require—that EPGN be

completely responsible for the operation of its entire network service purchased by the customer. Because the single most common cause of network failure is equipment failure, it is imperative that a wholesale telecommunications provider be able to monitor its network 24 hours/day, 7 days/week. If EPGN were unable to offer this performance guaranty, we would not be able to effectively operate as a wholesale telecommunications carrier. For this reason, dark fiber, which EPGN "lights" by placing its own optical electronic equipment on the fiber, has value that cannot be effectively replaced by any other ILEC UNE.

9. As I previously noted, EPGN must guarantee its customers superior network performance compared to the ILEC, as well as better pricing, in order to acquire traffic that would otherwise be carried on the ILEC network. The way in which EPGN guarantees superior performance is through service level agreements ("SLAs"). These SLAs commit EPGN to exceeding the ILEC in network reliability performance, repair intervals, and outage credits. In fact, because EPGN offers its customers a "gold standard" SLA, if EPGN fails to meet the performance levels specified in its SLA for any given month, the customer gets a bill credit for up to the entire month's service. It is, therefore, quite clear that EPGN's survival is critically dependant on its ability to successfully perform under its SLAs.

10. The only ILEC UNE that allows EPGN to completely control its customers' service quality is dark fiber. If EPGN were required, because of the unavailability of ILEC dark fiber, to purchase an ILEC high capacity service (either as a UNE or as a tariffed service), the ILEC will not guarantee EPGN's service levels, or

outage credits, commensurate with EPGN's contractual liability to its own customers. Thus, if EPGN is forced to use exclusively ILEC lit services to serve our customers, the ILEC will have an unacceptable level of control over EPGN's service quality, and consequently, its revenues.

11. I declare that the foregoing is true and correct to the best of my knowledge.

Executed this 5th day of February, 2003.

Signature
Pantios Manias
El Paso Global Networks

Measuring the Economic Impact of the Telecommunications Act of 1996: Telecommunications Capital Expenditures (1996–2001)

Prepared for:

Competitive Telecommunications Association
1900 M Street, NW
Suite 800
Washington, DC 20036-3508

Prepared by:

New Paradigm Resources Group, Inc.
12 S. Michigan Avenue
Chicago, IL 60603
www.nprg.com

October, 2002

Executive Summary

Enactment of the Telecommunications Act of 1996 removed the remaining legal barriers to competition for local telecom service, unleashing an explosion of capital spending by companies rushing to build competing networks and offer competitive services. Capital spending by newly formed competitive carriers, existing long distance carriers (IXCs) and other telecommunications providers, seeking to benefit from opportunities promised by the new law, or reacting to the resulting wave of competition, stimulated capital investment in excess of that which would have been made had the law not been passed.

New Paradigm Resources Group, Inc. (NPRG) has conducted an analysis of spending across the CLEC, Utility Telecom, IXC, ILEC, and cable industries to determine just how much of total capital spending during the period 1996 to 2001 is attributable to the '96 Act. NPRG aggregated capital spending among competitive carriers, as direct beneficiaries of the '96 Act, and measured the effect of enhanced competition on the remainder of the competitive telecom sector. As a result, we conclude that over $150 billion in telecommunications capital expenditures resulted from enactment of the law. The following chart reflects the capital spending by the respective market segments analyzed.

Total '96 Act-Related Capital Expenditures
By Carrier Catergory
1996-2001
(Millions)

Carrier Category	*Total Capital Expenditures*
Voice-Focused CLECs	$44,451
Independent Operating Carrier (IOC)-Owned CLECs	$1,416
Utility Telecom CLECs	$2,072
DLEC & Fiber LEC	$16,357
Utility Telecoms	$6,600
Additional IXC Capital Spending on Equipment Due to the '96 Act	$13,951
Additional ILEC Capital Spending on Equipment Due to the '96 Act	$47,083
Cable Broadband	$18,400
Total Capital Expenditures	**$150,330**

Source: New Paradigm Resources Group, Inc.

This total spending level attributable to the '96 Act represents 2% of all U.S. capital spending and 28% of all communications spending by all market participants – wireline, wireless and cable – for the period. The amount spent equals more than $520 for every man, woman and child in the country. This reflects a significant investment in our nation's telecommunications infrastructure, which will create tomorrow's economic growth.

The Purpose of this Report

One principal goal of the Telecommunications Act of 1996 ('96 Act) was to create a new national regulatory environment that stimulates the creation of technologically advanced, competing, yet interconnected telecommunications networks, over which new and existing carriers would offer consumers a host of familiar and new communications services. Notwithstanding the current state of the telecommunications industry, this goal has been largely realized.

The capital expenditures pumped into the telecommunications industry beginning in 1996 financed the construction of a massive stock of communications infrastructure. Some would argue that this infrastructure will provide the asset base upon which the economy of the 21st century will be built.

That having been said, we are unaware of any study to date that actually has attempted to measure the stimulative effect the '96 Act has had on capital expenditures. Therefore, in this study New Paradigm Resources Group, Inc. (NPRG)[1] has quantified the total dollar amount of capital investment contributed by major carrier groups—Competitive Local Exchange Carriers (CLECs), Utility Telecoms, long distance carriers (IXCs), Incumbent Local Exchange Carriers (ILECs) and cable broadband providers—during the period from 1996 to 2001, which is attributable to the enactment of the '96 Act.

Our Methodology

In order to measure capital spending that could reasonably be attributed to the existence of the new law, NPRG took two steps. First, we aggregated the total capital expeditures made by the facilities-based CLECs. Although a significant handful of competitive carriers were formed as competitive access providers (CAPs) prior to the '96 Act, the CLECs certainly owed their ongoing operations to its enactment.

Second, we identified and allocated relevant capital spending by the Utility Telecoms, IXCs, and ILECs. The '96 Act had the effect of creating actual and perceived growth in wholesale services demand, spurring spending by the utilities and IXCs. The law also had the effect of pushing the ILECs to spend more, both to comply with pro-competitive mandates and to take advantage of new opportunities created by the '96 Act.

In all of these allocation exercises, NPRG sought to be conservative in attributing spending to the '96 Act and in excluding items from double counting. Where there was subjectivity involved in whether to include an item as associated with a response to the Act, we tended to exclude that item from our allocation. However, many of these

[1] New Paradigm Resources Group, Inc. (NPRG) is a research and consulting firm focusing on competitive telecommunications companies and markets. On the basis of its ongoing research and analysis, NPRG publishes a range of telecom segment reports. These reports include: *CLEC Report*™ (Editions 1-16), *Broadband Provider Report*™ (Editions 1-2), *Utilities in Telecom Report*™ (Editions 1-2), *Competitive IOC Report*™, *Gig-E/MAN Report*™, *DSL Report*™ (Editions 1-2), and *BLEC Report*™ (Editions 1-2).

subjective topics were affected by the Act. Finally, in cases where we have attempted to measure the indirect, or flow-through effects of the Act we have been scrupulously conservative.

What the '96 Act Did

Immediately after passage, the '96 Act spurred communications investment and spending, most directly within the facilities-based Competitive Local Exchange Carrier (CLEC) sector. But the '96 Act was by no means the beginning of the boom, nor was it the only factor. In fact, Competitive Access Providers (CAPs) such as Brooks, MFS, and TCG already deployed local telecom infrastructure before the '96 Act.[3] But what the law did do was nationalize a public policy that was already moving away from a regulated monopoly regime in favor of competitive markets for local dial tone. Investors knew that once let out, the genie would not be returned to the bottle.

Moreover, by 1996, the Internet boom was underway, a motivating stimulant that pushed carriers to lay fiber in expectation of 1,000% per year growth in data traffic.[4] Coupled with a simultaneous explosion of new technology announcements, the Internet and wider "dot-com" mania certainly had an impact on carriers' decisions to spend dollars on capital goods, in particular fiber infrastructure.

Table 1:
Total U.S. Communications Service Provider Capital Expenditures[2]
(1996-2001)

Year	Communications Capital Expenditures (billions)	Year-over-Year increase
1994	$37	-
1995	$38	3%
1996	$48	26%
1997	$57	19%
1998	$77	35%
1999	$99	29%
2000	$135	36%
2001	$114	-16%
Total for period 1996-2001	**$530**	**138%**

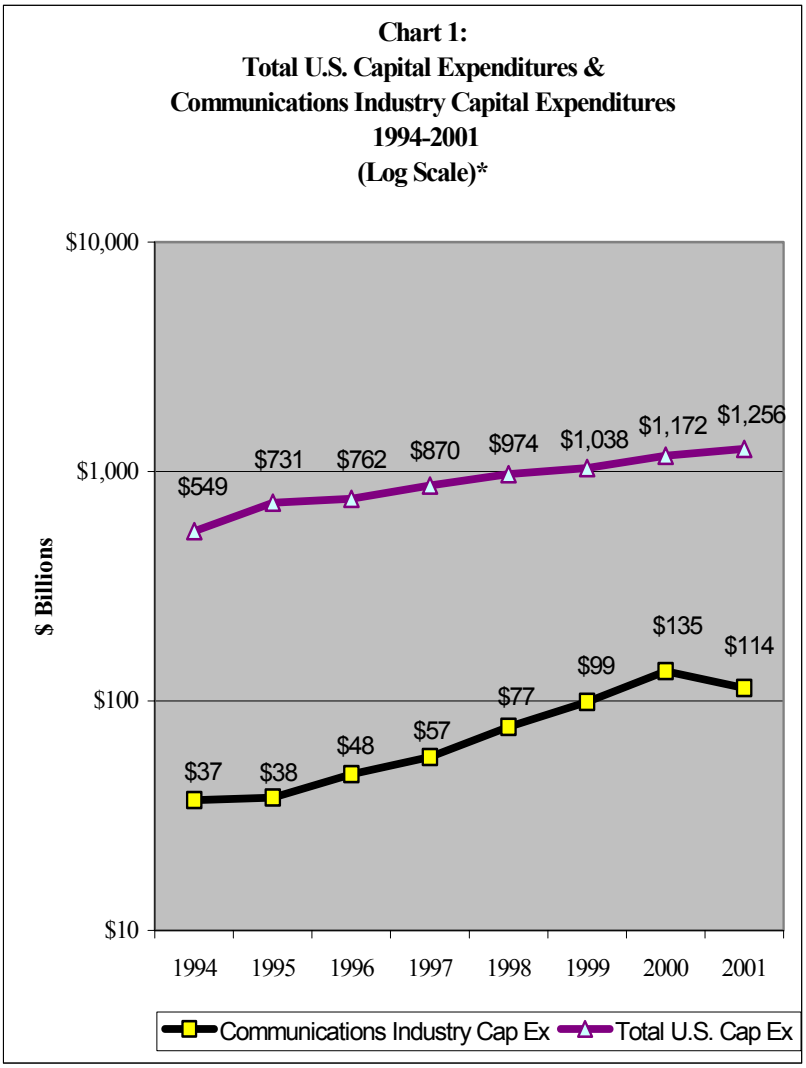
Source: U.S. Census Bureau, NPRG Analysis & Estimates

And spend they did (see Table 1 and Charts 1 and 2). The nearly flat 3% yearly increase of 1995 withers in the face of an astounding communications capital spending growth rate of 36% in 2000. During the same period, communications as a percentage of overall capital spending also jumped, more than doubling from 5% to almost 12%.

[2] "Total U.S. Communications Service Providers Capital Expenditures" is derived from the U.S. Census Bureau's *Annual Capital Expenditures* reports for 1994-2000. It includes wired, wireless, cable, satellite, telecommunications reseller, and other telecom capital expenditures for 1999 and 2000. For 1996-1998, the number is derived from a single category entitled "Telephone and other communications services." The totals for 2001 are NPRG estimates.

[3] For more on the evolution of CAPs into CLECs, see p. 32 of Richard G. Tomlinson, Ph.D, *Tele-Revolution, Telephone Competition at the Speed of Light, A History of the Creation of the Competitive Local Telephone Industry 1984-2000*, May 2000, Penobscot Press. See also Martin F. McDermott III, *CLEC, An Insider's Look at the Rise and Fall of Local Exchange Competition*, July 2002, Penobscot Press.

[4] See references to WorldCom in *Wall Street Journal*, "Behind the Fiber Glut," September 26, 2002.

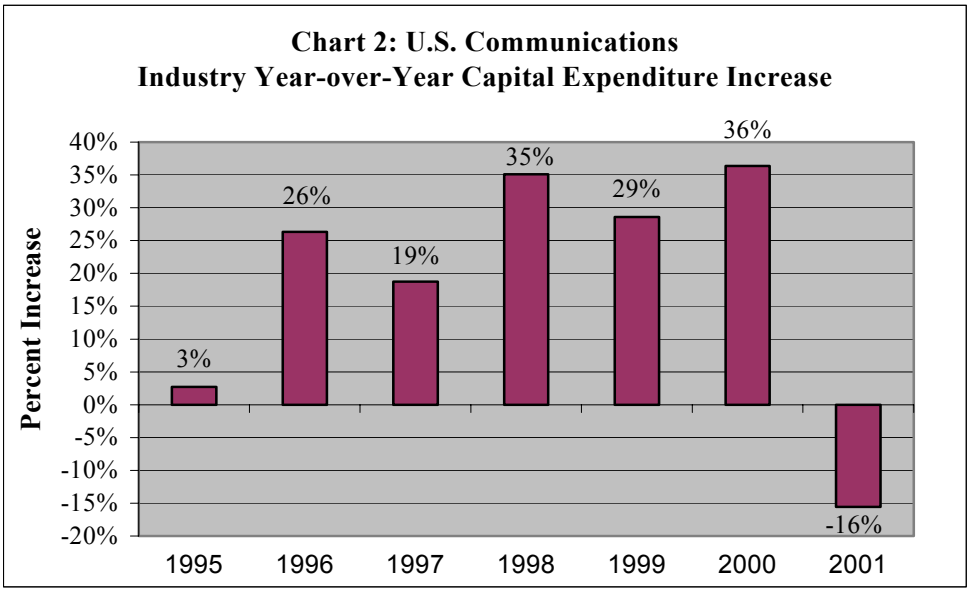


Source: U.S. Census Bureau, NPRG Analysis & Estimates

** Using this log rhythmic scale, we can see that communications capital expenditures grew at a faster rate than overall capital spending across the economy, jumping from a 6.3% share of all capital expenditures in 1996 to a high of 11.5% in 2000, the year of highest carrier spending. This points to increased capital expenditures after the '96 Act.*

The '96 Act certainly concentrated the attention of entrepreneurs and investors on competitive local telecom as an opportunity to sell local voice and data service. This in itself was an opportunity for profit.

But coupled with the decade-earlier breakup of the long distance monopoly, the '96 Act also induced the belief that communications was achieving complete competition, bringing an almost messianic belief that there would be massive growth, that the resulting growth would be fast, and that it would drive the development of a new economy predicated on rich, pervasive connectivity.



Source: U.S. Census Bureau, NPRG Analysis & Estimates

It was universally agreed that the copper-based local exchange was a bottleneck that was the single most dangerous impediment to the rollout of advanced connectivity. The '96 Act was expected to facilitate the breaking of that bottleneck. By removing the legal barriers to the last mile, the '96 Act motivated widespread desire to invest in infrastructure deployment and services rollout. From a rational perspective, the risk of an unbreakable local bottleneck was mitigated.

The '96 Act is more fundamental than the Internet explosion or deployment of new technologies. The law formally coalesced these forces around the notion that customers could now be connected. From a rational perspective, the risk of an unbreakable local bottleneck was now largely mitigated.

The after-effect of the '96 Act was to further chisel away at this risk by rapidly creating a competitive local market and market-support structures.[5] The growing list of CLECs and other competitive carriers included many that were competing with the Bell Operating Companies (BOCs) to offer voice services. But many others also began to focus on data transport and connectivity. The likes of Covad, NorthPoint and Rhythms spurred DSL deployment, ultimately pushing the larger BOCs to move beyond their fear

[5] See Tomlinson and McDermott for detail on the rapid development of the CLEC market and its associated trade groups. NPRG's editions of the *CLEC Report*™ quantitatively describe the speed of the segment's growth, with the 1997 edition (looking back at 1996) assessing the activities of no fewer than 90 companies providing or about to provide competitive telecom service and the 1998 edition covering 160 companies.

of cannibalizing dedicated access revenues by deploying DSL. Still others such as MFS and Focal were at the vanguard of offering competitive collocation and local connectivity to ISPs, altering the process and economics of Internet provisioning.[6]

As a result of the '96 Act, five major groups of carriers set out to re-build the last mile. The facilities-based CLECs, Utility Telecoms, IXCs, ILECs, and cable broadband providers spend considerable amounts in anticipation of participating in this telecom revolution. These are the groups we have assessed for this report.

Facilities-Based CLEC Spending

We first look at the capital spending of the companies directly stemming from the '96 Act—the facilities-based CLECs. To capture the capital expenditure total for this group, NPRG executed a two-step process. First, we broke down the facilities-based CLEC industry into four sub-categories: Traditionally Voice-Focused CLECs; Independent Operating Carrier (IOC)-owned CLECs; Utility CLECs; and data CLECs (DLECs)[7] and Fiber LECs (See Table 2 below). This enabled us to make sure that all relevant companies were considered. Second, we calculated capital expenditure totals for all companies, aggregated these numbers by sub-category, and then created a total aggregating all four sub-categories.

Table 2: Facilities-Based CLEC Sub-Categories
Traditionally Voice-Focused CLECs
IOC-Owned CLECs
Utility Telecoms
DLECs (including BLECs) & Fiber LECs

Source: New Paradigm Resources Group, Inc.

NPRG utilized its proprietary data and research (primary/secondary) and relied on its expertise in the telecommunication space as a basis for the first sub-category, facilities-based CLECs. Table 3 lists some of the carriers that we analyzed for this sub-category. We aggregated yearly capital expenditure numbers for all public and private carriers[8] for the years 1996-2001.

[6] See Tomlinson, p. 291, in which MFS Chairman Jim Crowe is quoted as saying "when the players are able to bundle local and long distance Internet service provision, there will be an alignment. There will be tremendous opportunity for those that have facilities in the bottleneck portion of that equation which continues to be the local loop…Our facilities in the local loop are no less valuable for the provision of Internet services than they are for the provision of voice services."

[7] Through our coverage of the DLECs, we also look at the Building Local Exchange Carriers (BLECs).

[8] For private carriers, we attempt to capture a number or range through ongoing discussions with management. We also develop capital expenditure models based on discussions with a wider group of personnel at each company, on an analysis of the amount of infrastructure deployed by each company, and on an assessment of total funding.

We chose to exclude the capital spending of CLEC resellers and ISPs that have invested in infrastructure for planned deployment of voice or for Internet phone service. Reseller spending would have likely occurred in the absence of the '96 Act. Moreover, it is certainly minimal. Regarding Internet telephony expenditures, it is doubtful that a realistic estimate could be calculated. And again, the capital spending total is small and would not materially affect overall numbers.

Table 3: A Sampling of Traditionally Voice-Focused CLECs	
Allegiance Telecom, Inc.	Mpower Communications
AT&T Corp. (Local)	Time Warner Telecom, Inc.
Cablevision Lightpath, Inc.	Winstar Communications
Focal Communications Corp.	WorldCom, Inc. (Local)
McLeodUSA, Inc.	XO Communications

Source: New Paradigm Resources Group, Inc.

Table 4 lists our capital expenditure calculations for the traditionally voice-focused CLECs by year for the period 1996-2001.

Table 4: Traditionally Voice-Focused CLEC Capital Expenditures 1996-2001 (Millions)

Year	1996	1997	1998	1999	2000	2001	Total (1996-2001)
Capital Expenditures	$1,550	$3,076	$5,938	$9,999	$13,890	$9,998	$44,451

Source: New Paradigm Resources Group, Inc.

The next sub-category was those IOC-owned CLECs pursuing an edge-out strategy.[9] Edge-out CLECs have relied on their parents' infrastructure and reputations to compete in adjoining BOC territories. But for the '96 Act, these carriers would have been prohibited from such an "out-of-territory" strategy. Table 5 provides a sampling of the 102 carriers analyzed for this sub-category.

Table 5: A Sampling of IOC-Owned CLECs	
CenturyTel, Inc.	Northland Communications Group
CTSI, Inc.	NTELOS, Inc.
HickoryTech	Otter Tail, Inc.
Logix Communications Enterprises, Inc.	TDS Metrocom
Madison River Communications	XIT Communications

Source: New Paradigm Resources Group, Inc.

[9] See NPRG's *Competitive IOC Report*™ for more information on 102 such operations.

NPRG fully analyzed 32 of the companies in the category. As for the remaining 70, we developed a model to estimate capital spending, using conservative assumptions. These 70 companies constitute a small percentage of total capital spending. For example, the 2001 estimated capital expenditure total for these 70 came to only 28.5% of ALLTEL's entire competitive telecom spending, and less than 10% of all category capital spending for the year.[10]

Table 6 provides the yearly totals for the IOC-owned CLEC sub-category.

Table 6:
IOC-Owned CLEC Capital Expenditures
1996-2001
(Millions)

Year	1996	1997	1998	1999	2000	2001	Total (1996-2001)
Capital Expenditures	$0	$2	$81	$260	$502	$571	$1,416

Source: New Paradigm Resources Group, Inc.

The next sub-category of CLECs we analyzed for this study was the utility-owned CLECs.[11] Table 7 provides a sampling of the 10 companies assessed.

These carriers are CLECs organized by utility companies to take advantage of the '96 Act. They differ from the utility telecoms in the next section in that, as CLECs, they provide local dial tone. The utility telecoms are non-certified wholesale transport providers.

Table 7:
A Sampling of Utility CLECs

Black Hills FiberCom, L.L.C.	MP Telecom
Digital Teleport Inc.	Reliant Energy Communications, Inc.
ExOp of Missouri, Inc.	TXU Communications

Source: New Paradigm Resources Group, Inc.

Table 8 provides the yearly totals for the utility CLEC sub-category.

[10] It also important to note here that while we developed a complete list of IOCs presently edging out of territory through a CLEC operation, many of the other approximately 975 ILECs across the U.S. are preparing to roll out such service. Some have only upgraded their technology with the expectation of edging out of territory and begin competing with other ILECs; others have actually purchased additional equipment for their CLEC strategy. We have not attempted to capture an estimate of this total as it would be difficult to measure and any calculation would be highly speculative.

[11] See NPRG's *Utlities in Telecom Report*™, 2nd Edition, for more information on these carriers.

Table 8: Utility CLEC Capital Expenditures 1996-2001 (Millions)							
Year	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Total (1996-2001)**
Capital Expenditures	$30	$40	$121	$652	$580	$649	$2,072

Source: New Paradigm Resources Group, Inc.

The next sub-category, the DLECs and Fiber LECs, is itself made up of many sub-groups, including the competitive DSL and Gigabit-Ethernet (Gig-E) players (see Table 9 for a sampling of these companies), the Building Local Exchange Carriers (BLECs) (see Table 10), and the Fiber LECs (see Table 11).[12]

Table 9: A Sampling of DLECs (DSL & Gig-E sub-group)	
@Link Networks	IP Communications
Cogent Communications	NorthPoint Communications
Covad Communications Company	Rhythms NetConnections
DSL.net, Inc.	Sphera Optical Networks, Inc.
GiantLoop Network Inc.	Yipes

Source: New Paradigm Resources Group, Inc.

Within this category, we included capital expenditure data from 15 DSL and 10 Gig-E/MAN providers, all of which are facilities-based CLECs. We have also thoroughly analyzed all eight of the CLEC-certified fiber layers, as well as the 17 carriers that pursued the BLEC model between 1999 and today.

Table 10: A Sampling of DLECs (BLEC sub-group)	
Allied Riser Communications	EurekaGGN
Cypress Telecommunications Corporation	Everest Broadband Networks
e-link Communications	PhatPipe

Source: New Paradigm Resources Group, Inc.

[12] See NPRG's *Broadband Provider Report™, DSL Report™, Gig-E/MAN Report™, and BLEC Report™* for more about the carriers in this sub-category.

Table 11: A Sampling of Fiber LECs	
American Fiber Systems, Inc.	Looking Glass Networks
Cambrian Communications	Metromedia Fiber Network, Inc.
FiberNet Telecom Group, Inc.	NEON Optica, Inc.
Level 3 Communications	Parker Fibernet, L.L.C.

Source: New Paradigm Resources Group, Inc.

Table 12 provides the yearly totals for the DLEC and Fiber LEC sub-category.[13]

Table 12: DLEC & Fiber LEC Capital Expenditures 1996-2001 (Millions)							
Year	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Total (1996-2001)**
Capital Expenditures	$0	$250	$583	$3,581	$6,144	$5,799	$16,357

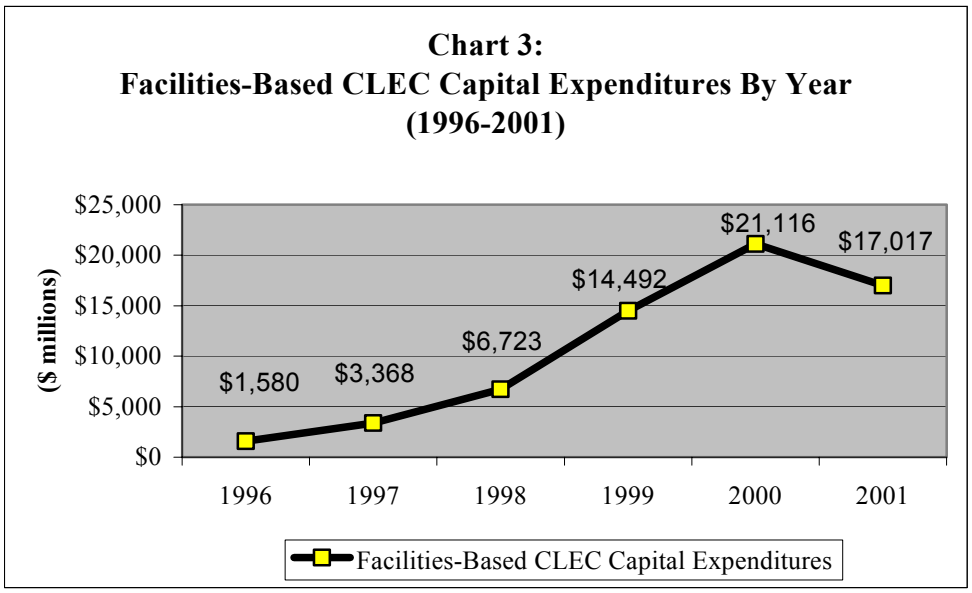
Source: New Paradigm Resources Group, Inc.

By adding up these four CLEC sub-categories we get $64.3 billion, the lower bound for our analysis of '96 Act-related capital spending (see Table 13 and Chart 3).

Table 13: Total Facilities-Based CLEC Capital Expenditures 1996-2001 (Millions)							
Year	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**Total (1996-2001)**
Capital Expenditures	$1,580	$3,368	$6,723	$14,492	$21,116	$17,017	**$64,296**

Source: New Paradigm Resources Group, Inc.

[13] As a point of methodology, NPRG conducted its analysis to avoid double counting between this CLEC analysis and our long distance carrier analysis below. Thus, special consideration was given to carriers such as Level 3, which have both local and long distance spending components.



Source: New Paradigm Resources Group, Inc.

Utility Telecom Spending

Apart from the utility CLECs analyzed above, NPRG fully analyzed 35 utility telecom companies (see Table 14). In the course of conducting research on the dark fiber market, moreover, we assessed a wider array of utility-related communications operations.[14]

Our ongoing research illustrates that the motivation of these companies' utility parents to enter communications was a reaction to metro-area growth stemming out of CLEC growth—in other words, out of the '96 Act. We corroborated this point during our dark fiber research,[15] as well as during research into wholesale private line carriers.[16] NPRG sees these carriers' spending as a direct result of the '96 Act.

As with the facilities-based CLEC analysis above, we conducted capital expenditure analysis across all the companies and aggregated company totals.

[14] NPRG, *Assessment of Dark Fiber Providers*, January 2002 (78 Pages).

[15] *Ibid.*

[16] NPRG, *Wholesale Special Access: Markets, Competitors, Products and Trends*, September 2002 (681 pages).

Table 14: A Sampling of Utility Telecom Operations	
Aerie Networks, Inc.	PECO*Adelphia* Communications
AFN Communications	Progress Telecom
C3 Networks	Seren Innovations
El Paso Global Networks	Sierra Pacific Communications
FPL FiberNet, LLC	Touch America
GPU Telecom Services, Inc.	Vectren Communications Services

Source: New Paradigm Resources Group, Inc.

Table 15 lays out the capital spending resulting from the analysis we conducted of this category.

Table 15: Utility Telecoms Capital Expenditures 1996-2001 (Millions)	
	Total (1996-2001)
Utility Telecoms Capital Expenditure Total	**$6,600**

Source: New Paradigm Resources Group, Inc.

Additional IXC Capital Spending on Equipment Due to the '96 Act

For long-haul carrier capital spending on equipment, NPRG calculated an estimate attributable to the '96 Act.

IXC capital spending on equipment jumped dramatically in anticipation of larger amounts of voice and data coming out of the metro due to the '96 Act, as well as data increases stemming from the Internet expansion, itself spurred on by the effects of the new law. After the '96 Act, long-haul providers' spending was primarily on "fiber cable, high-speed SONET, and DWDM optical transport systems, digital cross connects, ATM switches/gateways and IP routers," equipment intended to increase their ability to deal with the increasing demand for bandwidth at the local exchange level.[17]

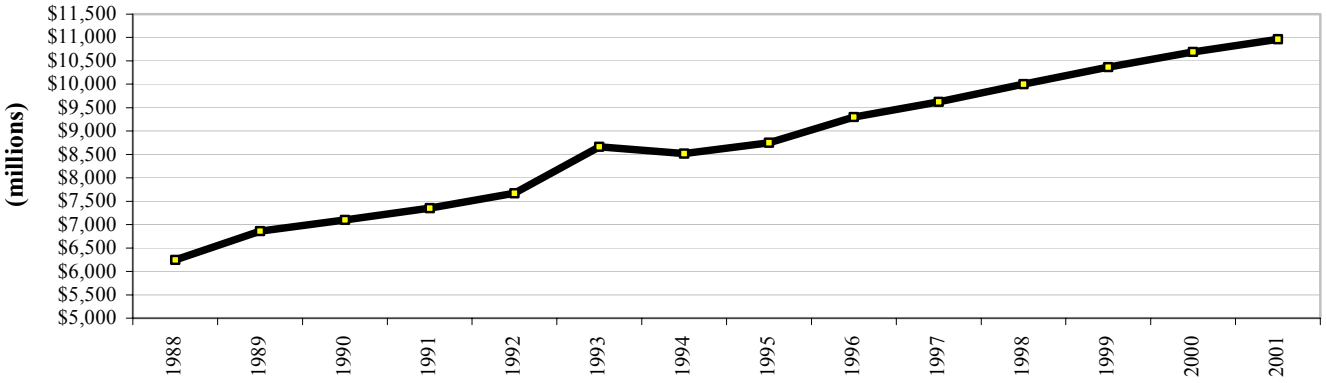
We began by setting out to find pre-1996 capital spending data. Based on a set of 1988-1995 central office (CO) equipment expenditure data,[18] we forecasted a post-1996

[17] Quote is from Skyline Marketing Group, *CapEx Report™,* First Quarter 1999. This view, however, is voiced across numerous other studies conducted during the period.

[18] TIA's Carrier Equipment Spending Charts*,* 1997-2002 *Telecommunications Market Review and Forecast* reports.

trend line to develop a picture of what equipment spending would look like in the absence of the '96 Act (see Chart 4). By comparing this "What if?" forecast with actual post-1996 spending, we calculated a percentage spread between actual and expected spending.

Chart 4:
Capital Spending on Central Office Equipment
(Post-1996 Trend Estimated without Effects of '96 Act)



We chose to apply this actual-over-expected calculation only to long-haul *equipment* spending. This minimized the possibility of capturing spending on new Operational Support Systems (OSS) and other purely operational improvements that carriers, like many companies during the 1990s, were drawn into by the IT boom.

NPRG also lowered the actual-over-expected percentage spread before applying it to the range of equipment beyond CO expenditures. The logic here is that these other forms of equipment spending might have been expected to grow more quickly post-1996 than CO equipment spending.[19]

The revised percentage spreads illustrated in Table 16 were then applied to the expected yearly equipment capital spending totals we developed.[20] Chart 5 illustrates actual expenditures relative to expected capital spending for the period. [21]

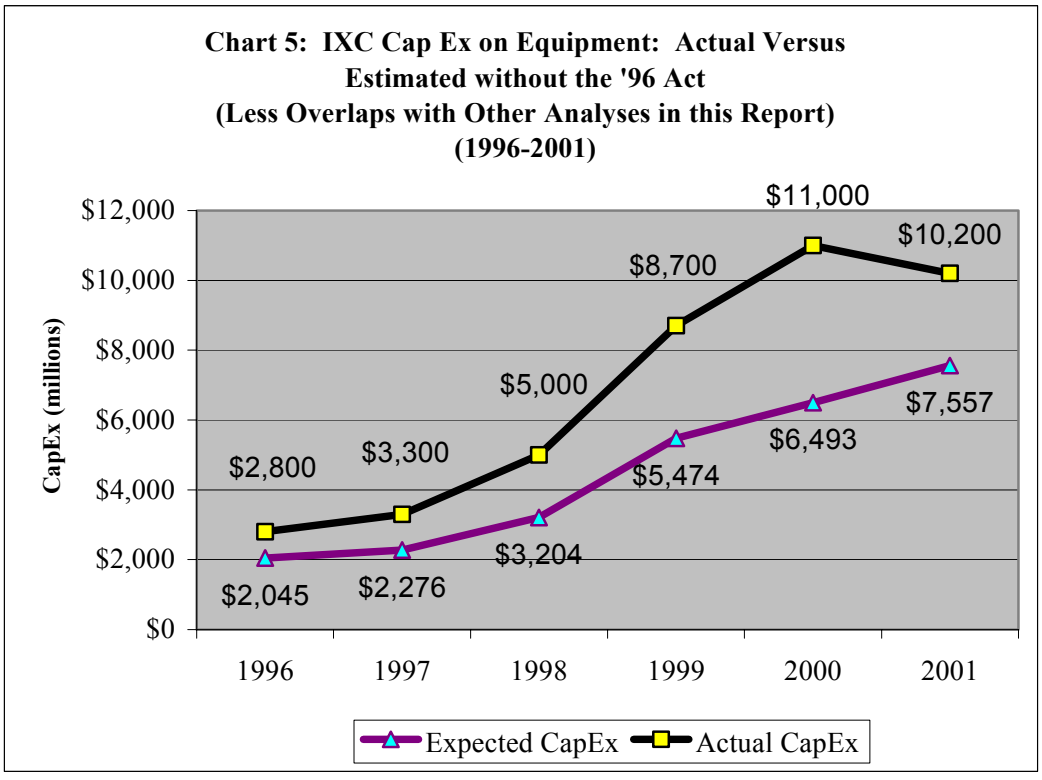
[19] A total of two basis points was shaved from the spreads for 1996-97, three from 1998-99, four from 2000, and two from 2001.

[20] TIA, *Telecommunications Market Review and Forecast 2002.*

[21] The totals were vetted for all overlapping between spending in this analysis and IXC capital expenditures related to CLEC operations and included in the CLEC analysis above.

Table 16: Calculated Yearly Spreads Actual over Expected	
Year	**Spread**
1996	37%
1997	45%
1998	56%
1999	59%
2000	69%
2001	34%

Source: New Paradigm Resources Group, Inc.



Source: New Paradigm Resources Group, Inc.

Table 17 breaks the final calculation down by year for the period 1996-2001, providing us with the surplus of IXC equipment capital spending attributable to affects of the '96 Act.

Table 17: Calculation of '96 Act-Related IXC Capital Expenditures on Equipment (Less Overlaps with Other Analyses in this Report) 1996-2001 (Millions)			
Year	**Expected Equipment Capital Spending**	**Actual Equipment Capital Spending**	**Incremental Increase**
1996	$2,045	$2,800	$755
1997	$2,276	$3,300	$1,024
1998	$3,204	$5,000	$1,796
1999	$5,474	$8,700	$3,226
2000	$6,493	$11,000	$4,507
2001	$7,557	$10,200	$2,643
TOTAL	**$27,049**	**$41,000**	**$13,951**

Source: New Paradigm Resources Group, Inc.

Additional ILEC Capital Expenditures on Equipment Due to the '96 Act

It has not only been the IXCs that increased capital spending as a result of the '96 Act. The Incumbent Local Exchange Carriers (ILECs), including the Bell Operating Companies (BOCs) and Independent Operating Companies (IOCs), also increased their capital expenditures in response to the newly competitive environment.

The ILECs' portion of total wireline equipment spending fell from 76% to 66% between 1996 and 2001. The CLECs and IXCs boosted capital spending much more aggressively than the ILECs from 1996 to 1999. In 2000, however, the ILECs increased their capital expenditures on equipment by a massive 21%.[22] As they were forced past their fear of cannibalizing their dedicated access revenues by the growth in competitive DSL, they started pumping up their capital spending in response to what was clearly real competition in both the voice and data categories. This competition and the resulting capital spending increases were a direct effect of the '96 Act.

NPRG measured the ILECs' additional capital spending using largely the same techniques as applied to the IXCs above. Again, we applied the percentage spreads of actual over expected from Table 15, and pulled out capital spending that overlaps with other analyses. The calculations follow in Table 18.

[22] All previous statistics in this paragraph taken from TIA, *Telecommunications Market Review and Forecast 2002.*

Table 18: Calculation of '96 Act-Related ILEC Capital Expenditures on Equipment (Less Overlaps with Other Analyses in this Report) 1996-2001 (Millions)			
Year	**Expected Equipment Spending**	**Actual Equipment Spending**	**Incremental Increase**
1996	$13,608	$18,636	$5,028
1997	$14,251	$20,659	$6,408
1998	$14,409	$22,486	$8,077
1999	$15,144	$24,070	$8,926
2000	$17,061	$28,903	$11,842
2001	$19,447	$26,249	$6,802
TOTAL	**$93,920**	**$141,003**	**$47,083**

Source: New Paradigm Resources Group, Inc.

Effect on Cable Broadband Capital Spending

Cable's ongoing deployment of telephony service is a direct result of the '96 Act. We captured these cable capital expenditures related to telephony in the CLEC analysis above. It is also important to consider, however, certain other aspects of the cable industry's capital spending.

Cable's aggressive broadband deployment is another effect of the '96 Act. The reason we assert this is two-fold. First, the '96 Act created a core of aggressive competitors that appeared to be creating an alternate infrastructure to compete with the cable companies.[23] The introduction of competitors aggressively talking about convergence—and thus the potential for combined video, voice and data—forced cable operators into a faster rollout of broadband data services. Second, the competition that all sides began feeling as a result of more carriers pushed most players into marketing bundles of services. Again, this put pressure on the cable companies to aggressively deploy broadband as part of a wider package of goods to compete with other broadband industries.

To capture the amount of capital spending associated with cable's broadband rollout, we began by calculating the number of cable broadband subscribers passed, using the latest available figures (see Table 19).

[23] The development of broadband infrastructures generally, but IP and other packetized services specifically, suggested the convergence of video, voice, and data.

Our next step was to determine how much capital, per subscriber, was expended to deploy cable broadband. This data was uncovered in investment banking analyses of the industry. [24]

Table 19: Total Cable Broadband Subscribers (June 30, 2002)	
TOTAL	9,200,000

Source: National Cable & Telecommunications Association

Table 20 provides a breakdown of subscribers, capital spending per subscriber, and the resulting cable broadband capital expenditure total.[25]

Table 20: Total Cable Broadband Capital Spending 1996-2001	
Total Subscribers	9,200,000
Capital Expenditures per Subscriber	$2,000
Total Cable Broadband Capital Expenditures (Millions)	**$18,400**

Source: New Paradigm Resources Group, Inc.

Categories Not Included in this Report

The conclusions of this survey are also notable for the capital expenditure numbers not included:

- First, we decided not to include the capital spending of vendors, opting to include only carrier spending.

- Second, we did not include mobile wireless providers. The dynamics of this industry are different from wireline, and while their capital spending might in part have been affected by the '96 Act, this would be very difficult to measure.

[24] The range used was $2,100 to $2,650 in net present value (NPV) capital spending per residential broadband subscriber, which we rounded down to $2,000. The final range comes from First Union Securities, *Residential Broadband Carrier Industry*, September 2000, p. 17.

[25] By multiplying the $2,000 amount by Table 18's 9.2 million-subscriber total, we are left with a total of $18.4 billion in capital spending for broadband deployment. Because this calculation only included present subscribers—and not households passed—coupled with the fact that capital spending per head would be higher in the beginning of a rollout (until the total is distributed across a larger, terminal number of subscribers), this is a low-end calculation of '96 Act-related spending.

- Third, we did not include cable industry capital spending beyond that associated with telephony and broadband deployment. This is, however, an important category, one that merits analysis to better determine the connection between its capital spending totals and the '96 Act.

Conclusion

Table 21 illustrates the aggregation of totals developed across our CLEC, Utility, IXC, ILEC, and cable industry analyses. It represents a massive 28% of all communications capital spending during the period ($530 billion from Table 1).[26] This means that '96 Act-related capital spending added almost 2% to overall U.S. capital expenditures for the period, a material amount.

Table 21:
Total '96 Act-Related Capital Expenditures Across Competitive Carriers
1996-2001
(Millions)

Carrier Category	Total Capital Expenditures
Voice-Focused CLECs	$44,451
IOC-Owned CLECs	$1,416
Utility Telecom CLECs	$2,072
DLEC & Fiber LEC	$16,357
Utility Telecoms	$6,600
Additional IXC Capital Spending on Equipment Due to the '96 Act	$13,951
Additional ILEC Capital Spending on Equipment Due to the '96 Act	$47,083
Cable Broadband	$18,400
Total Capital Expenditures	**$150,330**

This total amounts to more than $520 for every man, woman and child in the country. Moreover, this capital spending reflects a significant investment in our nation's telecommunications infrastructure, which will contribute to tomorrow's economic growth.

[26] This represents all communications spending, including wireline, wireless, and cable.