

anticipated demands.<sup>538</sup> Incumbent LECs counter that they have instituted procedures to provide timely coordinated cutovers to requesting carriers.<sup>539</sup> Where incumbent LECs have undergone comprehensive testing of their loop provisioning processes, however, independent auditors have found difficulties regarding coordinated loop cutover performance.<sup>540</sup> Furthermore, because broad-based residential competition is at best nascent, incumbent LECs generally have not successfully provisioned coordinated loop cutovers in the volumes necessary for requesting carriers to serve the mass market. We therefore find incumbent LEC promises of future hot cut performance insufficient to support a Commission finding that the coordinated loop cutover process does not impair the ability of a requesting carrier to provide the service it seeks to offer without unbundled circuit switching.<sup>541</sup> We recognize that the hot cut process requires manual processing, which likely creates delays between the time a requesting carrier wins a customer and the

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<sup>538</sup> AT&T Reply Comments at 105; Ameritech Reply Comments at 29 (stating that Ameritech has, to date, provisioned 185,000 unbundled loops and expects to provision 117,000 additional unbundled loops by end of 1999).

<sup>539</sup> BellSouth argues that in April, 1999, BellSouth cutover 70% of loop orders within 5 minutes and over 88% were performed in 15 minutes for a average time of 6.94 minutes. Bell South Reply Comments, Attachment E, Aff. of W. Keith Milner at para. 10. Ameritech argues that if coordinated loop cutovers are relevant to the impair analysis, it can accommodate any reasonably foreseeable demand, and its coordinated loop cutover process is not error-prone such that requesting carriers face service-quality impairments. Ameritech Reply Comments, Attachment B, Aff. of John B. Mayer at 11, 16-29, Schedules 1, 2. This assertion does not carry more weight merely because it is made in a sworn affidavit; assertions regarding future performance are inherently unsupportable.

<sup>540</sup> In Texas, SBC is undergoing a third party test of its coordinated loop cutover processes by Telcordia Technologies, Inc. In their July, 1999 OSS report, Telcordia states that “[e]ighteen ordering types for UNE-L (loop provisioning) were tested, of which nine were successfully ordered and provisioned by SBC. Nine ordering types did not meet expectations, of which six have been selected” for retesting. The Public Utility Commission of Texas Southwestern Bell Operations Support Systems Report, Issue 1, July 1999, at Pg. ES-9. In New York, Bell Atlantic is undergoing a third party test of its coordinated loop cutover process by KPMG. In their July, 1999 OSS report, KPMG states that Bell Atlantic technicians performing “disconnects and Main Distribution Frame (MDF) rewiring are not performing their activities in a synchronized manner at the requested Frame Due Time of the order and perform some portion of cut either late or early.” KPMG Draft Final Report, July 22, 1999, at IV-67. *See also* Communications Daily, July 28, 1999 at 10 (“Major uncorrected exceptions [found by KPMG in NY] include BA problems with meeting deadlines for “hot cuts,” where BA disconnects loops from its own network and reconnects it to requesting carrier’s network. BA has claimed 95% of hot cuts are performed on time and without service interruptions, but AT&T claims real rate is only 75%.”); Letter from Robert W. Quinn, Jr., Director – Federal Government Affairs, AT&T, to Mr. Jake Jennings, Special Advisor, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed August 18, 1999) (citing supplemental affidavit of Mr. Jack Meek before the New York Department of Public Service). Mr. Meek’s affidavit contends that for the period March 23 through July 23 approximately 13% of BA-NY’s hot cut loop orders resulted in errors attributable to BA-NY.

<sup>541</sup> Our insistence on actual performance – and not future promises -- of incumbent LEC compliance with our rules is not new. *See* Application of Ameritech Michigan Pursuant to Section 271 of the Communications Act of 1934, as amended, To Provide In-Region, InterLATA Services in Michigan, CC Docket No. 97-137, *Memorandum Opinion and Order*, 12 FCC Rcd 20543 (1997) (*Ameritech Michigan 271 Order*).

time it can provide service to that customer. Accordingly, we find that the coordinated loop cutover process impairs the ability of a requesting carrier to provide timely service.

272. Goals of the 1996 Act. As noted above, our unbundling analysis takes into account whether unbundling a particular network element is consistent with the goals of the 1996 Act.<sup>542</sup> We find our decision to unbundle local circuit switching is consistent with the 1996 Act's goals of rapid introduction of competition and the promotion of facilities-based entry.

273. Our unbundling analysis considers how the switch unbundling obligation we adopt will encourage requesting carriers to rapidly enter the local market in order to serve the greatest number of customers, and whether the failure to require unbundling will cause any class of consumers to wait unnecessarily for competitive alternatives. Failure to unbundle local circuit switching would cause residential and small business consumers to wait unnecessarily for competitive alternatives. As discussed above, the costs and operational delays associated with collocating in multiple end offices and provisioning delays caused by the inability of a requesting carrier to gain access to unbundled local circuit switching will cause residential and small business customers to wait for service. Requiring incumbent LECs to provide access to unbundled switching, and to use unbundled switching in combination with other network elements, will allow requesting carriers to serve the greatest number of customers, without incurring collocation and switch provisioning delays. Where unbundled switching has been made available, requesting carriers have gained market share in the residential and small business markets.<sup>543</sup> Accordingly, we find that requiring incumbent LECs to provide access to unbundled switching will allow requesting carriers to rapidly enter local markets.

274. We also find that the availability of unbundled switching will also accelerate the development of alternative networks because it will allow requesting carriers to generate revenues to justify the construction of new switching facilities.<sup>544</sup> As noted above, many carriers emphasize that they plan to deploy alternative facilities as soon as it is technically and economically possible to do so at a cost close to the

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<sup>542</sup> See *supra* Section IV(B)(4)(b)(iii).

<sup>543</sup> MCI WorldCom Reply at 42-46; AT&T Reply at 23-24; SBC Reply at 3-4. Since these combinations of unbundled network elements have become available, competitive LECs have started offering service in the residential mass market in those areas. For example, in January of this year, Bell Atlantic, as part of an agreement with the New York Department of Public Service, began offering the unbundled network element platform out of particular end offices in New York City. As a result, between January 1, 1999 and May 26, 1999, MCI WorldCom acquired upwards of 60,000 new local residential customers. AT&T also plans to begin serving local residential customers over the platform in Texas. See *supra* Section I.

<sup>544</sup> See, e.g., AT&T Comment at 21-22 (stating that using unbundled network elements also facilitates the transition to facilities-based competition because it permits entrants to gather critical information, such as customers' calling volumes and traffic patterns that they need to plan their facilities' deployment); ALTS Comment at 20-24; MCI WorldCom Comment at 8.

incumbent LECs' prices for network elements.<sup>545</sup> Granting requesting carriers access to unbundled switching will allow these carriers to serve customers in areas where traffic volumes and customer densities make it difficult initially to justify deploying a switch. Furthermore, allowing requesting carriers to purchase unbundled switching will allow new entrants to test market demand for circuit switched services before deploying their own facilities. As requesting carriers obtain customers using unbundled switching, we expect that the revenues generated from this activity will enable requesting carriers to extend the reach of their existing switching capabilities or deploy switching capability to serve the residential and small business market.

275. On balance, we conclude that local circuit switching should be unbundled nationwide. We now consider whether it would be appropriate to establish an exception to the national unbundling requirement.

**(iv) Exception to National Unbundling Requirement**

276. As discussed in section IV above, we do not limit our unbundling analysis to the cost, timeliness, ubiquity and quality factors described above. Rather, we look at the totality of the circumstances and marketplace developments when considering whether a requesting carrier is impaired without access to unbundled local circuit switching. In addition to examining where requesting carriers have deployed switches, we look to the marketplace to see which customers are receiving service from facilities-based competitors. To the extent the market shows that requesting carriers are not serving a market segment with self-provisioned switches, we find that this fact is probative evidence that for a discrete market segment requesting carriers are impaired without access to unbundled local circuit switching. Conversely, to the extent that the market shows that requesting carriers are generally providing service in particular situations with their own switches, we find this fact to be probative evidence that requesting carriers are not impaired without access to unbundled local circuit switching. The task before us is to develop an administratively simple rule that reflects marketplace developments and provides certainty to market participants. We seek to adopt a rule that serves as a reasonable proxy for when competitors are indeed impaired in their ability to provide the services they seek to offer.

277. In their initial and reply comments in this proceeding, the parties take sharply diverging positions regarding the circumstances and geographic areas where local circuit switches should be unbundled, if at all. Incumbent LECs generally support elimination of their obligation to unbundle local circuit switches in a geographic area

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<sup>545</sup> See CompTel Comments at 12; MCI WorldCom Comments at 8-9, 26-27; Net2000 Comments at 2-3; Sprint Comments at 16-19.

where one requesting carrier has deployed a single local circuit.<sup>546</sup> Competitive LECs oppose the incumbent LEC proposals for elimination of the circuit switch unbundling obligation and argue that local circuit switching should be unbundled on a national basis.<sup>547</sup> In several *ex parte* presentations after the record closed, a number of parties softened their initial positions and propose a more narrowly tailored rule for determining when circuit switching need not be unbundled.<sup>548</sup> A number of other parties respond to these fall-back positions in subsequent *ex parte* presentations.<sup>549</sup>

278. Despite our conclusion that, in general, requesting carriers are impaired without access to unbundled switching, we conclude that it is appropriate to establish a more narrowly tailored rule to reflect significant marketplace developments. As described more fully below, we find that requesting carriers are not impaired without access to unbundled local circuit switching when they serve customers with four or more lines in density zone 1 in the top 50 metropolitan statistical areas (MSAs), as set forth in Appendix B, where incumbent LECs have provided nondiscriminatory, cost-based access to the enhanced extended link (EEL) throughout density zone 1.<sup>550</sup>

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<sup>546</sup> Ameritech Comments at 5-6, 84; Bell Atlantic Comments at 23; BellSouth Comments at 56; SBC Comments at 42; GTE Comments at 39; USTA Comments at 34; US WEST Comment at 44.

<sup>547</sup> See, e.g., Cable & Wireless Comments at 36; KMC Comments at 15; Net2000 Comments at 13; Sprint Comments at 31; Qwest Comments at 70; AT&T Comments at 86.

<sup>548</sup> See Letter from Chuck Goldfarb, Director, Law and Public Policy MCI WorldCom, to Lawrence E. Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98, at 4 (filed August 9, 1999) (concluding that the top 29 MSAs should define the geographic scope of an incumbent LEC's local circuit switch unbundling obligation); Letter from Christopher M. Heimann, Director of Legal Affairs, Ameritech, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed September 7, 1999) (stating that Ameritech "would not oppose an MSA approach pursuant to which ULS and the UNE platform would not be made available in the top 100 MSAs in the United States."); CompTel August 19, 1999 *Ex Parte* (arguing that local circuit switching should not be unbundled in density zone 1 within the highest density MSAs); Letter from Kathleen B. Levitz, Vice President – Federal Regulatory, BellSouth, to Ms. Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed July 29, 1999) (proposing that local circuit switching should not be unbundled in zones 1 and 2 or in rate exchange areas served by one of more CLEC switches).

<sup>549</sup> See Letter from Robert W. Quinn, Jr., AT&T, to Mr. Lawrence Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed August 19, 1999) (AT&T August 19, 1999 *Ex Parte*) (arguing AT&T would be impaired if local circuit switching is not unbundled in MSAs 36-100); Letter from David Scott, Birch Telecom, to Jake E. Jennings, Special Advisor, Common Carrier Bureau, Federal Communications Commission, CC Docket No. 96-98 (filed September 8, 1999) (opposing attempts to restrict the availability of unbundled local circuit switching); Letter from Melissa Newman, Vice President – Federal Regulatory U S WEST, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed August 18, 1999) (opposing MCI's MSA approach);

<sup>550</sup> 47 C.F.R. § 69.123 of the Commission's rules define the parameters for the establishment of density pricing zones that allow price-cap LECs to charge geographically deaveraged rates for switched transport services. Density zone 1 is the geographic area with the highest access line density and amount of traffic volume.

279. Top 50 MSAs. We conclude that it is appropriate to create an exception to the switching unbundling obligation in certain circumstances in the top 50 MSAs, as they are defined by the Office of Management and Budget.<sup>551</sup> We thus respond to various suggestions in the record that an exception from the switching unbundling obligation should encompass the top 29, top 35 and top 100 MSAs in the United States.<sup>552</sup>

280. As previously noted, as of March, 1999, approximately 167 different competitors have deployed approximately 700 switches throughout the country.<sup>553</sup> When we analyze where requesting carriers have deployed these switches, we find that most of these switches have been deployed within the confines of the top 50 MSAs.<sup>554</sup> According to USTA's data, which relies on the Local Exchange Routing Guide, approximately 61 percent of all requesting carrier switches nationwide have been deployed in the top 50 MSAs.<sup>555</sup> More significantly, the vast majority of these MSAs contain multiple switches owned by competitors. In particular, four or more competitive switches have been deployed in 96 percent of the top 50 MSAs.<sup>556</sup> According to USTA's data, only two MSAs in the top 50 -- Cincinnati and Las Vegas -- have less than three requesting carrier switches serving an incumbent LEC rate exchange area within the MSA.

281. Based on the evidence in the record, we conclude that exempting incumbent LECs from unbundling local circuit switching in certain circumstances in the top 50 MSAs is reasonable because nearly all of the top 50 MSAs contain a significant number

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<sup>551</sup> An MSA is made up of a county or group of contiguous counties surrounding a city with a population of 50,000 or more. The Office of Management and Budget defines MSAs for use in federal statistical activities pursuant to 44 U.S.C. § 3504(d)(3) and 31 U.S.C. § 1104(d). Presently, there are 258 MSAs in the United States.

<sup>552</sup> See Letter from Chuck Goldfarb, Director, Law and Public Policy MCI WorldCom to Larry Strickling, Chief, Common Carrier Bureau, Federal Communications Commission, at Page 4, CC Docket No. 96-98 (filed August 9, 1999) (Top 29 MSAs); AT&T August 19, 1999 *Ex Parte* (Top 35 MSAs); Letter from Christopher M. Heimann, Director of Legal Affairs, Ameritech, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed September 7, 1999) (analysis of top 100 MSAs).

<sup>553</sup> USTA UNE Report at I-1.

<sup>554</sup> USTA UNE Report at I-11 ("Rate Exchange Areas in top 50 MSAs Where CLECs Have Obtained NXX Codes"). We recognize also that requesting carrier switches may serve more than one rate exchange area. See USTA UNE Report at I-23 ("According to the March 1999 LERG, the average CLEC switch in BOC and GTE territory has NXX codes for 14 rate exchange areas.").

<sup>555</sup> USTA UNE Report at I-11 ("Rate Exchange Areas in top 50 MSAs Where CLECs Have Obtained NXX Codes"). We note that the remainder of the switches if evenly deployed throughout MSAs 50-200 would result in no MSA having more than 2 requesting carrier switches in an MSA. For example, the USTA UNE Report states that there are 12 competitive LEC switches in New York, 23 competitive LEC switches in Washington, D.C., 19 competitive LEC switches in Atlanta, 11 competitive LEC switches in Seattle and 12 competitive LEC switches in Denver.

<sup>556</sup> See USTA UNE Report at I-11.

of competitive switches.<sup>557</sup> In contrast, MSAs below the top 50 typically contain fewer competitive switches. For example, in US WEST's territory, no MSA between 50 and 150 contains more than three competitive switches.<sup>558</sup> In the top 100 MSAs in Ameritech's territory, only six percent of Ameritech's wire centers are served by four or more competitive switches.<sup>559</sup>

282. We recognize that drawing the line at the top 50 MSAs means that incumbent LECs serving more rural territories, which have fewer MSAs that are in the top 50 MSAs, will continue to be subject to an unbundled switching obligation. We nonetheless believe that this is a reasonable exercise of our administrative discretion. Extending an incumbent LEC's switch unbundling exemption to include more than the top 50 MSAs would require us to find that requesting carriers are not impaired without unbundled access to local circuit switching in these MSAs. We have no basis in the record before us to make such a finding because there are relatively few competitive switches outside of the top 50 MSAs.

283. We note that collocation costs and delay, as compared to revenue potential, may contribute to the relative lack of robust competitive switch deployment in areas outside of the top 50 MSAs. As discussed above, the total costs of a competitor using self-provisioned local circuit switching on an MSA basis include the costs incurred in providing service to every customer that the competitor seeks to serve. We concluded above that collocation imposes indirect costs on carriers installing their own switches.<sup>560</sup> We also found that the amount of collocation cost are likely to vary according to individual requesting carriers.<sup>561</sup> We believe that the revenue potential of serving less

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<sup>557</sup> See USTA Comments, Tab 3, Map 1 (overlaying borders of top 50 MSAs to CLEC switches; Source: March 1999 LERG). CompTel also submitted the following data to describe competitive LEC operations in the top 50 MSAs. Where carriers obtain unbundled loops, they are providing service with their own switch. In the New York MSA, there are 2,154,569 business lines and the incumbent LEC has provisioned 49,442 unbundled loops resulting in a market share for all competitive LECs of 2.2 percent. In the Los Angeles MSA, there are 2,149,360 business lines and the incumbent LEC has provisioned 46,561 unbundled loops resulting in a market share of 2.1 percent. In the Chicago MSA, there are 2,068,118 business lines and the incumbent LEC has provisioned 20,469 unbundled loops resulting in a market share of 1.0 percent. In the Washington, D.C. MSA, there are 1,657,658 business lines and the incumbent LEC has provisioned 3,391 unbundled loops resulting in a market share of .2 percent. In the Boston MSA, there are 1,355,657 business lines and the incumbent LEC has provisioned 3,098 unbundled loops resulting in a market share of .2 percent. See CompTel August 19, 1999 *Ex Parte*.

<sup>558</sup> See Letter from Melissa Newman, Vice President – Federal Regulatory, US WEST, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 Attachment A (filed August 18, 1999) (US WEST August 18, 1999 *Ex Parte*).

<sup>559</sup> See Letter from Christopher M. Heimann, Director of Legal Affairs, Ameritech to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed September 7, 1999) (Ameritech September 7 *Ex Parte*).

<sup>560</sup> See *supra* Section (V)(D)(1).

<sup>561</sup> *Id.*

dense markets outside the top 50 MSAs is unlikely to outweigh the costs of collocating in these markets, and accordingly, competitors are impaired without access to unbundled local switching.

284. Density Zone 1. When we examine the deployment of switches by competitors at a more granular level, we find that, based on the record before us, requesting carriers have deployed greater numbers of switches in areas of high customer density. Several incumbent LECs argue that switching should not be unbundled in dense wire centers, but each proffers its own geographic market definition for our local circuit switch unbundling analysis.<sup>562</sup> BellSouth proposes, and other incumbent LECs support, the use of density zones 1 and 2 to capture the areas in which competitors have deployed switches and where incumbent LECs need not unbundle switching.<sup>563</sup>

285. We conclude that it is appropriate to create an exception to the local circuit switching unbundling obligation only in density zone 1, within the top 50 MSAs. The exception applies to density zone 1 as it was defined on January 1, 1999. Based on the limited evidence in the record, we believe that density zone 1 closely reflects the wire centers where competitive LEC switches are located. In particular, of the seven markets in the top 50 MSAs served by BellSouth, each MSA contains at least one density zone 1<sup>564</sup> where approximately 97 percent of all competitive LEC switches have been deployed.<sup>565</sup> We recognize that only one commenter, BellSouth, provided detailed data to describe where requesting carriers have deployed switches in density zone 1. The record does not contain similar data for other incumbent LECs. Given the record before us and the need to provide a measure of certainty to the market, we believe that drawing a line at density zone 1 within the top 50 MSAs represents a reasonable approximation of where requesting carriers are not impaired without access to unbundled local circuit switching.

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<sup>562</sup> *Id.*

<sup>563</sup> 47 C.F.R. § 69.123. Incumbent LECs generally proceed through a three-step process to assign central offices to density zones within a given study area. In the first step, an incumbent LEC ranks its wire centers in order of decreasing traffic density, based on some measure of density chosen by the incumbent LEC. In the second step, the incumbent LEC sets breakpoints within the zone density ranking to partition the wire centers into zones, and finally, an incumbent LEC further adjusts the zones as it sees fit, based on geographic contiguity or community of interest reasons. See *Expanded Interconnection Order*, 7 FCC Rcd at 7454-55, para. 179; 47 C.F.R. § 61.38(b)(4). See also *Access Charge Reform*, CC Docket No. 96-262, Fifth Report and Order and Further Notice of Proposed Rulemaking, 1999 WL 669188, (rel. August 5, 1999). See Letter from Kathleen B. Levitz, Vice President – Federal Regulatory BellSouth, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed July 28, 1999) (Incumbent LEC Joint *Ex Parte*) (96% of Zone 1 wire centers served by one or more CLEC switches; 84 % of Zone 2 wire centers served by one or more CLEC switches).

<sup>564</sup> BellSouth Comments at Attachment D.

<sup>565</sup> See BellSouth Comments at 59. Specifically, in Atlanta, competitive LECs have deployed 20 switches in zone 1; in Miami, 13 switches in zone 1; in Orlando, 9 switches in zone 1; in Charlotte, 9 switches in zone 1; in New Orleans, 7 switches in zone 1; in Nashville, 7 switches in zone 1; and in Greensboro, 2 switches in zone 1.

286. In order to prevent incumbent LECs from modifying their density zones to limit their unbundling obligation for local circuit switching, we freeze, for unbundling purposes, the incumbent LECs' density zone 1 as it was defined on January 1, 1999. Otherwise, incumbent LECs would retain significant discretion to define their density zone boundaries in the future. The Commission reviews incumbent LEC zone density pricing plans under a "reasonableness" standard.<sup>566</sup> For example, our rules allow incumbent LECs to define zone boundaries upon a showing that "the assignment of central offices to each of the zones reflects cost-related characteristics, such as traffic density or some measure of traffic through each office."<sup>567</sup> MCI WorldCom argues that using the zone approach would allow incumbent LECs to "redefine breakpoints to put more central offices into zones in which the incumbent LECs were not required to provide switching as an unbundled network element" and would allow incumbent LECs to "change their methodologies for defining zones to upset their competitor's business plans."<sup>568</sup> To address the possibility that incumbent LECs, going forward, could amend their density zones to minimize their unbundling obligations, we create an exception to the unbundling obligation in the density zones as they existed on January 1, 1999.<sup>569</sup> We believe that freezing the zones as of January 1, 1999, for purposes of section 251 unbundling obligations, addresses MCI WorldCom's concerns.

287. As discussed in our unbundling analysis above, as requesting carriers' switch utilization rates increase, the difference between the switching costs incurred by competitive and incumbent LECs decreases, and the per line switching costs will decrease as a requesting carrier's customer base grows.<sup>570</sup> Because of increased demand for telecommunications services and the enhanced revenue opportunities associated with

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<sup>566</sup> See *GTE Service Corporation Revised Zone Density Pricing Plan*, Order, 10 FCC Rcd. 5696, 5697 para. 7 (1995); *BellSouth Telecommunications Inc., GTE Service Corporation, Lincoln Telephone and Telegraph Co. NYNEX Telephone Companies, Pacific Bell, and Rochester Telephone Corporation Zone Density Pricing Plans*, Order, 8 FCC Rcd 4443, 4446, para. 8 (1993) (*First Zone Density Order*).

<sup>567</sup> See *Expanded Interconnection Order*, 7 FCC Rcd at 7454-55, para 179; 47 C.F.R. § 61.38(b)(4). MCI WorldCom notes that it is unaware of any zone density plan that has been found unreasonable. Letter from Chuck Goldfarb, Director, Law and Public Policy, MCI WorldCom to Larry Strickling, Chief, Common Carrier Bureau, Federal Communications Commission (filed August 9, 1999).

<sup>568</sup> MCI WorldCom argues that where a requesting carrier plans to purchase unbundled switching, the incumbent LEC could change its methodology for ranking central office traffic density in such a way that the central office changed zones, and the incumbent LEC was no longer required to offer switching to requesting carriers. MCI is further unaware of any incumbent LEC methodology or zone plan that has ever been found unreasonable. See MCI WorldCom August 9 *Ex Parte*.

<sup>569</sup> See *CompTel August 19 Ex Parte* (supporting use of density zone 1 as they existed on January 1, 1999 in top MSAs.).

<sup>570</sup> As previously noted, MCI WorldCom contends that at 10% percent market penetration, switching costs for a requesting carrier are about 132% above incumbent LEC switching costs but decrease to 31% above incumbent LEC switching costs at 30% penetration levels. See MCI WorldCom Comments at 51 and MCI WorldCom Bryant Decl. at para. 30).

serving customers in high-density areas, such as density zone 1, we find that requesting carriers serving these dense areas are able to make more efficient use of their switching facilities, and can thus counter incumbent LEC scale economies. We therefore find that the cost of purchasing a circuit switch does not impair a requesting carrier's ability to provide the services it seeks to offer in density zone 1, in certain circumstances.

288. Need for Enhanced Extended Link. Our conclusion that competitors are not impaired in certain circumstances without access to unbundled switching in density zone 1 in the top 50 MSAs also is predicated upon the availability of the enhanced extended link (EEL). As noted in section VI(B) above, the EEL allows requesting carriers to serve a customer by extending a customer's loop from the end office serving that customer to a different end office in which the competitor is already collocated. The EEL therefore allows requesting carriers to aggregate loops at fewer collocation locations and increase their efficiencies by transporting aggregated loops over efficient-high capacity facilities to their central switching location. Thus, the cost of collocation can be diminished through the use of the EEL. We agree with ALTS that, if requesting carriers can obtain nondiscriminatory, cost-based access to the enhanced extended link, their collocation costs would decrease, and they would need to collocate in as few as one incumbent LEC central office in an MSA to provide service.<sup>571</sup>

289. We are not persuaded by arguments that use of the EEL produces only a short term advantage over collocation.<sup>572</sup> Although we agree with SBC that distance-sensitive EEL costs can exceed the costs associated with collocation over time, we find that the ability of a requesting carrier to provision EELs more quickly than collocation arrangements, without the substantial upfront costs of establishing collocation in multiple central offices, can reduce significantly the costs of self-provisioning a switch in the initial phase of an entry strategy. When projected EEL costs exceed projected collocation costs, competitive LECs may reconfigure their networks to ensure the continued efficiency of their networks. We conclude that requesting carriers, reacting to marketplace demands and their own network topologies, are better able to weigh the costs and benefits of EELs compared to collocation and adjust their plans accordingly. Where a requesting carrier chooses the EEL, we find that it reduces a requesting carrier's reliance on collocation.

290. Customers with Four or More Lines. Our analysis of an incumbent LEC's local circuit switching obligation has focused primarily upon the geographic areas where

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<sup>571</sup> ALTS Comments at 62.

<sup>572</sup> In Texas, SBC compares a \$21 monthly loop cost and a \$29 EEL cost which does not include approximately \$40 per month of distance sensitive transport costs (assuming 8 miles from the SBC central office to collocation cage). SBC further assumes that requesting carriers incur on average a \$15,405 non-recurring charge for collocation and a \$995 recurring charge per month for collocation. Thus, under SBC's cost analysis, it would take a requesting carrier a matter of months before the recurring EEL and transport costs are greater than the up-front collocation expenses. See Letter from Lincoln E. Brown, Director - Federal Regulatory, SBC, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed July 15, 1999).

competitive carriers have deployed switches. We now consider whether, within these geographic areas, market facts demonstrate that requesting carriers are not impaired without access to local circuit switching for discrete market segments or customer classes.

291. We conclude that without access to unbundled local circuit switching, requesting carriers are impaired in their ability to serve the mass market. As discussed above, our unbundling analysis takes into account market conditions to determine whether a requesting carrier is impaired without access to unbundled local circuit switching. Since the Commission adopted the *Local Competition First Report and Order*, competition has continued to develop, primarily for business customers or users with substantial telecommunications needs.<sup>573</sup> Commenters in this proceeding generally argue that requesting carriers have deployed switches to serve medium and large business customers and are not yet serving mass market customers, which largely are residential customers.<sup>574</sup> No party in this proceeding, however, identifies the characteristics that distinguish medium and large business customers from the mass market.

292. There are several methods we could use to distinguish between the mass market and the medium and large business market for purposes of our unbundling analysis. For example, we could use revenues, number of employees, number of lines, or some other factor to distinguish between the mass market and the medium and large business market.

293. We find, however, that a rule that provides access to unbundled local switching for requesting carriers when they serve customers with three lines or less captures a significant portion of the mass market. First, virtually all residential customers would be captured by such a rule. While an increasing number of American homes are served by second lines, we believe it is a rare case in which residences have three lines, and even more unusual for a home to have four or more lines. Second, any business that has three or fewer lines is likely to share more characteristics of the mass market customer than a medium and large business. In particular, small businesses are likely to use the same number of lines as many residential subscribers and purchase similar volumes and types of telecommunications services.

294. We recognize that a rule that removes unbundling obligations based on line count will be marginally overinclusive or underinclusive given individual factual circumstances. We find, however, that in our expert judgment, a rule that distinguishes customers with four lines or more from those with three lines or less reasonably captures

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<sup>573</sup> See *Advanced Services Memorandum Opinion and Order and NPRM*, 13 FCC Rcd at n. 80 (“The local competition that has developed has focused on larger business customers in large cities, not on residential or small business customers.”). See also *Trends in Telephone Service*, Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, September 1999, at Section 9-1.

<sup>574</sup> USTA UNE Report at I-10-I-19 & App. A. See also Ameritech Comments at 73-79; AT&T Reply Comments at 104; BellSouth Comments at 58-59; GTE Comments at 40-42, 46-47; SBC Comments at 36, 38; US WEST Comments at 42-43.

the division between the mass market – where competition is nascent – and the medium and large business market – where competition is beginning to broaden.

295. Our decision to examine mass market and larger business markets separately is consistent with the Commission's merger review analysis and the Commission's reform of the interstate access charge regime. In the *MCI-WorldCom* merger, we identified two distinct product markets – residential and small business, which we described as one market, and medium and large business customers, which we described as the larger business market.<sup>575</sup> In the *Access Reform* proceeding, the Commission distinguished between primary residences and single line businesses which constitute a large portion of the mass market, and multi-line business customers which constitute the medium and large business markets.<sup>576</sup> We therefore conclude that it is appropriate to make a similar distinction between mass market customers and larger business customers in creating an exception to the unbundling obligation for local circuit switching.

296. As discussed above, a requesting carrier is materially diminished in its ability to offer service to mass market customers without access to unbundled switching because it will face materially greater costs, materially greater delay, and will lack the same ubiquitous reach as the incumbent LEC's network. In addition to the costs of establishing a collocation arrangement with the incumbent LEC, we noted above that requesting carriers incur additional costs and face service quality impediments when extending a customer's loop to their collocation cages.<sup>577</sup>

297. In contrast, marketplace developments suggest that competitors are not impaired in their ability to serve certain high-volume customers in the densest areas. We believe that the coordinated cutover process will not necessarily impair the ability of a requesting carrier to serve an end user in density zone 1. Medium and large business customers are often sophisticated users of telecommunications services that are able to order their operations in a manner that minimizes disruptions that may be caused by

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<sup>575</sup> See *Application of WorldCom, Inc. and MCI Communications Corporation for Transfer of Control of MCI Communications Corporation to WorldCom, Inc.*, Memorandum Opinion and Order, 13 FCC Rcd 18025, at paras. 24-26 (1998) (“we identify two distinct product markets, reflecting customers groups with different patterns of demand: (1) residential customers and small business (mass market); and (2) medium-sized and large business customers (larger business market).”).

<sup>576</sup> See *Access Charge Reform*, CC Docket No. 96-262 et al., First Report and Order, 12 FCC Rcd 15982 (1997) (Access Charge Reform Order), aff'd sub nom. *Southwestern Bell Tel. Co. v. Fed. Communications Comm'n*, \_\_\_ F.3d \_\_\_ (8th Cir., Aug. 19, 1998); Order on Reconsideration, 12 FCC Rcd 10119 (1997), Second Order on Reconsideration and Memorandum Opinion and Order, 12 FCC Rcd 16606 (1997) (distinguishing between primary residences, single line business and multi-line business customers).

<sup>577</sup> See *supra* para. 268. We note that for medium and large business customers in dense wire centers, many requesting carriers serve these customers with their own SONET rings and thus incur no additional hot cut costs, delays or service quality impairments.

coordinated cutovers.<sup>578</sup> For example, requesting carriers seeking to provide service to medium and large business customers may engage in direct outbound marketing in such a way as to control coordinated cutover order flows to the incumbent LEC.<sup>579</sup> In addition, to the extent that incumbent LECs provide requesting carriers with unbundled switching to serve the mass market, requesting carriers will require fewer coordinated loop cutovers in the aggregate and can focus their efforts on coordinated cutovers for customers not served with unbundled local circuit switching.<sup>580</sup> Finally, because business customers generate comparably greater revenues than residential customers, requesting carriers may be more willing to incur the provisioning difficulties that may be present in the coordinated cutover process.

298. We conclude that carriers will not be impaired in their ability to serve high volume users only when the EEL is provided throughout density zone 1. While some customers in this area already are being served by facilities-based carriers without the EEL, the availability of the EEL will ensure that requesting carriers are able to serve customers ubiquitously throughout the area. If the EEL is available and a requesting carrier seeks to serve a high volume business, the incumbent LEC can provision the high capacity loop and connect directly to a requesting carrier's collocation cage.<sup>581</sup> In this scenario, the requesting carrier need not initiate a coordinated loop cutover. Moreover, the availability of the EEL substantially reduces the delay a requesting carrier would experience before it is able to actually provide service.<sup>582</sup>

299. Goals of the 1996 Act. As noted above, our unbundling analysis considers how the switching unbundling obligation we adopt will encourage requesting carriers to rapidly enter the local market and whether the failure to require unbundling will cause any class of consumers to wait unnecessarily for competitive alternatives. Our decision to relieve incumbent LECs from their unbundling obligations in the circumstances described above will not require medium and large businesses to wait unnecessarily for competitive

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<sup>578</sup> For example, coordinated cutovers that do not occur during normal business hours may not disrupt the operations of a business customer.

<sup>579</sup> For example, a competitive LEC may use a sales force instead of mass market advertising to control the demand for its services and thus the number of coordinated cutovers required to serve its customers.

<sup>580</sup> In Ameritech's territory, the market segment for business customers with three lines or less accounts for approximately 72 percent of Ameritech's business customer base. See Letter from James K. Smith, Director, Federal Relations, Ameritech, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed September 8, 1999) ("Ameritech Business Customer Base by Line Size").

<sup>581</sup> Furthermore, requesting carriers and incumbent LECs have developed routine provisioning processes to deploy the EEL using the ASR or Access Service Request process, and thus requesting carriers will not face material provisioning delays and costs to integrate the EEL into their networks.

<sup>582</sup> See Letter from Jonathan E. Canis, Counsel for ALTS, Intermedia, e.spire, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed August 27, 1999).

alternatives. We find that requesting carriers have deployed a large number of switches to serve medium and large business customers in the densest areas of the top 50 MSAs, and these medium and large business customers by and large, have a choice in their local service provider.<sup>583</sup> Accordingly, we find that relieving incumbent LECs of their unbundled switching obligation, as set forth herein, will not require medium and small business consumers to wait unnecessarily for competitive alternatives because they are largely available today. Furthermore, eliminating an incumbent LEC's local circuit switching obligation in these circumstances is consistent with our goal to reduce regulation when possible. Our decision also provides requesting carriers with access to the elements they need to ramp up towards continued deployment of self-provisioned switches and is therefore consistent with our policies of encouraging facilities-based competition and encouraging innovation.

## 2. Packet Switching

### a. Background

300. In the *Local Competition First Report and Order*, the Commission declined to find that incumbent LEC packet switches should be identified as unbundled network elements because the Commission did not have an adequate record to support such a conclusion.<sup>584</sup> In the *Notice*, we sought comment on whether “packet switches should be unbundled pursuant to section 251(c)(3), and whether there is “any basis for treating network elements used in the provisioning of packet-switched advanced services any differently than those used in the provisioning of circuit-switched voice services.”<sup>585</sup> Incumbent LECs argue that they generally trail in the deployment of packet switches, and therefore should not be subject to unbundling requirements that might eliminate their incentives to invest in equipment used to provide advanced services.<sup>586</sup> Several competitors argue in favor of unbundling packet switching to encourage the broad-based deployment of advanced services.<sup>587</sup>

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<sup>583</sup> AT&T Reply Comments at 104 (“AT&T’s two 5ESS switches in Dallas . . . are not being used ‘to reach . . . as much as 98 percent . . . of the addressable business and residential market’ as GTE claims is the case. [citations omitted]. Rather, those switches like AT&T’s DMS-100 in Washington, D.C. are being used to offer service to business customers. The same is true for each of AT&T’s local switching in other markets, such as Los Angeles, Denver, Detroit and Tampa.”).

<sup>584</sup> *Local Competition First Report and Order*, 11 FCC Rcd. at 15713, para. 427.

<sup>585</sup> *Notice* at para 35.

<sup>586</sup> SBC Reply Comments at 26-27, 74, 76-77; US WEST Comments at 57-58; BellSouth Comments at 32-33; Bell Atlantic Comments at 40. *See also* Ameritech Comments at 118; GTE Comments at 73 (Incumbent LECs should not have to unbundle packet switches because CLECs and cable companies lead in the deployment of such services.).

<sup>587</sup> Allegiance Comments at 16; Cable & Wireless Comments at 4; Covad Comments at 6; GSA Comments at 6; KMC Comments at 25-26; Net2000 Comments at 130; Qwest Reply Comments at 66.

301. We are aware, however, that US WEST has argued that section 251(c)(3) does not apply to any network elements, such as packet switches, used to provide advanced services, such as xDSL.<sup>588</sup> We note that the Commission has requested, and has received, a remand from the United States Court of Appeals for the District of Columbia Circuit to address US WEST's argument that the Commission is without statutory authority to require incumbent LECs to provide access to unbundled elements used in the provision of advanced services.<sup>589</sup> After receiving a more complete administrative record, we intend to fully address US WEST's arguments in the *Advanced Services Memorandum Opinion and Order and NPRM* remand proceeding.<sup>590</sup> In remanding back to the agency, the court declined to vacate portions of the *Advanced Services Memorandum Opinion and Order and NPRM* challenged by US WEST. Accordingly, our decision in that Order that xDSL services are "either" telephone exchange service or exchange access service remains in effect during the pendency of the *Advanced Services Memorandum Opinion and Order and NPRM* remand proceeding.<sup>591</sup> We therefore may consider whether packet switching should be unbundled under the framework established in this proceeding.

**b. Discussion**

**(i) Definition of Packet Switching**

302. As a threshold matter, we must define the functionality of the packet switching unbundled network element. In packet-switched networks, messages between network users are divided into units, commonly referred to as packets, frames, or cells. These individual units are then routed between network users. The switches that provide this routing function are "packet switches," and the function of routing individual data units based on address or other routing information contained in the units is "packet switching."<sup>592</sup>

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<sup>588</sup> US WEST Comments at 56, n. 122.

<sup>589</sup> See *US WEST v. Federal Communications Commission*, Order No. 98-1410 (D.C. Cir. Aug. 25, 1999).

<sup>590</sup> See Comments Requested in Connection with Court Remand of August 1998 Advanced Services Order, *Public Notice*, CC Docket Nos. 98-11, 98-26, 98-32, 98-78, 98-91, 98-147 (rel. September 9, 1999).

<sup>591</sup> *Advanced Services Memorandum Opinion and Order and NPRM*, 13 FCC Rcd at 24032, at para. 40.

<sup>592</sup> With packet switching, the packet switches place data units on inter-switch trunks only when there are active communications between network users. When users are not sending each other messages or packets, no bandwidth is used on the trunks between packet switches. By contrast, with voice connections between circuit switches, when both users are silent, the digital trunks carry digitally encoded silence. Inter-switch bandwidth is required even when no information is being exchanged.

303. We find that a component of the packet switching functionality, and included in our definition of packet switching is the Digital Subscriber Line Access Multiplexer (DSLAM). The DSLAM splits voice (low band) and data (high band) signals carried over a copper twisted pair. DSLAM equipment sometimes includes a splitter. If not, a separate splitter device separates voice and data traffic. The voice signal is transmitted toward a circuit switch, and the data from multiple lines is combined in packet or cell format and is transmitted to a packet switch, typically ATM or IP. The DSLAM combines: (1) the ability to terminate copper customer loops (which includes both a low-band voice channel and a high-band data channel, or solely a data channel); (2) the ability to forward the voice channels, if present, to a circuit switch or multiple circuit switches; (3) the ability to extract data units from the data channels on the loops; and (4) the ability to combine data units from multiple loops onto one or more trunks that connect to a packet switch or packet switches.

304. We define packet switching as the function of routing individual data units, or “packets,” based on address or other routing information contained in the packets. The packet switching network element includes the necessary electronics (*e.g.*, routers and DSLAMs). We find that packet switching qualifies as a network element because it includes “all features, functions and capabilities . . . sufficient . . . for transmission, routing or other provision of a telecommunications service.”<sup>593</sup> Because packet switching and DSLAMs are used to provide telecommunications services, packet switching qualifies as a network element.<sup>594</sup> We adopt a definition of packet switching that does not favor or disadvantage one packet switching technology over another. Our intention is to define packet switching in such a way as to capture the functionality of packet networks, without regard to a particular “packetizing” technology that an incumbent LEC has deployed in its network. Several parties propose definitions of packet switching which elaborate on the Commission’s existing circuit switching definition.<sup>595</sup> We decline to adopt proposed definitions of packet switching that exclude DSLAMs from the packet switching functionality.<sup>596</sup> We further decline to adopt equipment-specific packet switching network elements, as proposed by Intermedia and e.spire.<sup>597</sup> We find that with today’s technology, packetizing is an integral function of the DSLAM. Accordingly, we include the DSLAM functionality, with the routing and addressing functions of packet switches, in our functional definition of packet switching.

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<sup>593</sup> *Local Competition First Report and Order*, 11 FCC Rcd. at 15633, para. 262.

<sup>594</sup> ALTS Reply Comments at 57.

<sup>595</sup> CompTel Comments at 37-38; Qwest Reply Comments at 66.

<sup>596</sup> CompTel proposed a definition that includes the “assembling, disassembling, addressing, conversion or routing of digital information in packet form. The packet switching capability network element shall include all features, functions and capabilities of the packet switching and/or routing devices.” CompTel Comments, Appendix A at 5.

<sup>597</sup> e.spire Joint Comments at 30-31.

(ii) **Proprietary Concerns Associated With Packet Switching**

305. No party alleged that packet switching was proprietary within the meaning of section 251(d)(2). We find that the record provides no basis for withholding packet switching from competitors based on proprietary considerations or subjecting packet switching to the more demanding “necessary” standard set forth in section 251(d)(2)(A).<sup>598</sup> Instead we examine packet switching under the “impair” standard of section 251(d)(2)(B).

(iii) **Unbundling Analysis for Packet Switching**

306. We decline at this time to unbundle the packet switching functionality, except in limited circumstances. Among other potential factors, we recognize that the presence of multiple requesting carriers providing service with their own packet switches is probative of whether they are impaired without access to unbundled packet switching. The record demonstrates that competitors are actively deploying facilities used to provide advanced services to serve certain segments of the market — namely, medium and large business — and hence they cannot be said to be impaired in their ability to offer service, at least to these segments without access to the incumbent’s facilities. In other segments of the market, namely, residential and small business, we conclude that competitors may be impaired in their ability to offer service without access to incumbent LEC facilities due, in part, to the cost and delay of obtaining collocation in every central office where the requesting carrier provides service using unbundled loops. We conclude, however, that given the nascent nature of the advanced services marketplace, we will not order unbundling of the packet switching functionality as a general matter.

307. Both the record in this proceeding, and our findings in the *706 Report*, establish that advanced services providers are actively deploying facilities to offer advanced services such as xDSL across the country.<sup>599</sup> Competitive LECs and cable companies appear to be leading the incumbent LECs in their deployment of advanced services.<sup>600</sup> For example, in 1999, Rhythms expects to roll out xDSL services in 1,000 end offices nation wide.<sup>601</sup> Covad’s planned network deployment is expected to reach 51

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<sup>598</sup> See MGC Comments at 21; Net2000 Comments at 13-14; Rhythms Comments at 19; TRA Comments at 12.

<sup>599</sup> USTA UNE Report at VI-1 to 8. *706 Report*, 14 FCC Rcd at 2398. In the *706 Report*, we concluded that incumbents and competitive carriers alike have made tens of billions of dollars of investment in broadband facilities. Incumbent LECs alone have announced plans to offer broadband, xDSL services to approximately twenty million homes in 1999. *706 Report*, 14 FCC Rcd at 2419-20, para 42.

<sup>600</sup> See *706 Report*, 14 FCC Rcd at 2423-24, para. 48. See also Comments of GTE at 74.

<sup>601</sup> Rhythms Comments at 1 (“By the end of 1999, Rhythms plans to collocate networking equipment in at least 1,000 central offices and be operational in 33 metropolitan markets.”).

MSAs by the end of 1999.<sup>602</sup> In the past year, NorthPoint deployed facilities capable of transmitting xDSL signals in 17 metropolitan markets.<sup>603</sup> NorthPoint plans to expand its DSL-based local networks from 25 major markets, representing 37 metropolitan statistical areas (MSAs), to 28 markets, or 61 MSAs, by the end of 1999.<sup>604</sup> Qwest announced in August 1999, that it is now providing DSL service in 13 U.S. markets and plans to expand to more than 30 major markets by the end of 1999.<sup>605</sup> In addition, EarthLink has partnered with Sprint to offer nationwide xDSL service.<sup>606</sup> KMC Telecom Inc. announced aggressive rollout of DSL services with plans to introduce additional broadband applications by year-end.<sup>607</sup> Marketplace developments like the ones described above suggest that requesting carriers have been able to secure the necessary inputs to provide advanced services to end users in accordance with their business plans. This evidence indicates that carriers are deploying advanced services to the business market initially as well as the residential and small business markets.

308. Several parties, in addition to the incumbent LECs, argue that the Commission should not unbundle packet switching or DSLAMS generally.<sup>608</sup> We recognize that equipment needed to provide advanced services, such as DSLAMS and packet switches, are available on the open market at comparable prices to incumbents and requesting carriers alike.<sup>609</sup> Incumbent LECs and their competitors are both in the early

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<sup>602</sup> Covad Comments at 2 (“Covad’s planned network deployment by the end of 1999 will cover 51 MSAs, more than 25% of the nation’s homes and businesses”).

<sup>603</sup> NorthPoint Comments at 2 (“In the past year alone, for example, NorthPoint has begun offering service in 17 new markets in the United States, including San Francisco, New York, Chicago, Pittsburgh and Cleveland.”). *See also* Letter from John J. Heitmann, Counsel for Intermedia/e.spire to Magalie R. Salas, Secretary, Federal Communications Commission (filed July 21, 1999). (“e.spire has deployed 66 data switches nationwide and Intermedia has deployed 175 data switches”).

<sup>604</sup> NorthPoint Launches DSL Service in the Twin Cities; Offering the Speediest Business-Class DSL Service Around, August 3, 1999 <<[http://www.northpoint.net/press/press\\_990803.html](http://www.northpoint.net/press/press_990803.html)>>. NorthPoint Brings DSL Internet Access to Baltimore, PRNewswire, March 30, 1999.

<sup>605</sup> *Qwest Launches Digital Subscriber Line Service*, Cambridge Telecom Report, August 1, 1999 available at 1999 WL 8103900.

<sup>606</sup> Telephony, Communications Daily, July 15, 1999, at 11.

<sup>607</sup> Telephony, Communications Daily, June 8, 1999, at 10.

<sup>608</sup> Northpoint Comments at 18-19 (stating that when competitive LECs have access to loops and collocation, any competitive LEC can provide the necessary infrastructure, *i.e.* DSLAMs and packet switches); Rhythms Comments at 26 (stating that incumbent LECs “must make their DSLAMs available on an unbundled basis when advanced service providers are unable to access a full clean copper loop.”); Ohio PUC Comments at 15.

<sup>609</sup> *See* ITIC Comments at 6-7 (“ILECs’ competitors can acquire and install equipment for advanced services on a relatively equal footing with the incumbent LECs. The relevant electronic equipment is produced by numerous vendors, establishing a competitive equipment market that can effectively discipline prices, provisioning and other service terms for the foreseeable future.”).

stages of packet switch deployment, and thus face relatively similar utilization rates of their packet switching capacity. Packet switching utilization rates will differ from circuit switching utilization rates because of the incumbent LEC's monopoly position as carrier of last resort. Incumbent LEC circuit switches, because they serve upwards of 90 percent of the circuit switched market, may achieve higher utilization rates than the circuit switches of requesting carriers. Because the incumbent LEC does not retain a monopoly position in the advanced services market, packet switch utilization rates are likely to be more equal as between requesting carriers and incumbent LECs. It therefore does not appear that incumbent LECs possess significant economies of scale in their packet switches compared to the requesting carriers.

309. Collocating in incumbent LEC central offices imposes material costs and delays on a requesting carrier and materially diminishes a requesting carrier's ability to provide the services it seeks to offer. As discussed above, we identified the costs and delays associated with collocation as factors that impair a requesting carrier's ability to self-provision circuit switches to serve residential and small business market.<sup>610</sup> We see no reason to distinguish a requesting carrier's collocation-related costs and delays to provide circuit-switched service from those collocation costs and delays incurred by requesting carriers to provide packet-switched services. These costs and delays lead us to find that competitors are impaired in their ability to offer advanced services without access to incumbent LEC facilities. As discussed in more detail below, that conclusion is not dispositive of whether unbundling is appropriate at this time under section 251(d)(2). As discussed in section IV above, in addition to the "impair" standard we consider whether unbundling will open local markets to competition and how access to a given network element will encourage the rapid introduction of local competition to the benefit of the greatest number of customers.<sup>611</sup>

310. NorthPoint argues that an additional impediment it faces when providing advanced services using xDSL technologies is the absence of line sharing.<sup>612</sup> Currently, many incumbent LECs offer advanced services over the high-frequency range of the same loops they use to offer voice services. Although the incumbent LEC may use a single copper pair to provide xDSL services, in the absence of line sharing, requesting carriers providing xDSL services must purchase an additional unbundled loop to serve their customers, thereby incurring additional non-trivial costs. In light of the substantial number of packet switches deployed by competitive LECs, even in comparison to incumbent LEC deployment, we conclude that these non-trivial costs are substantial enough to impair the requesting carrier's ability to provide the services it seeks to offer within the meaning of section 251(d)(2). Unlike circuit switching services, however, requesting carriers providing data services do not face the operational impediment of obtaining a coordinated cutover of the loop on a timely basis, because they typically are

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<sup>610</sup> See *supra* Section (V)(D)(1).

<sup>611</sup> See *supra* Section IV.

<sup>612</sup> See NorthPoint Comments at 14-15.

providing service over a second line. Because such carriers purchase an additional unbundled copper loop to serve the customer, the customer's voice service is never disconnected, and the requesting carrier faces none of the timing and quality impediments associated with the "hot cut" process.

311. We further decline to unbundle specific packet switching technologies incumbent LECs may have deployed in their networks. E.spire/Intermedia request that we require incumbent LECs to unbundle: (1) the ports on their data switches or routers; and (2) the connectivity, including the switching fabric and associated software functions, between such ports at capacities ranging from DS0 to DS3.<sup>613</sup> E.spire/Intermedia focus their request upon a particular packet-switching technology -- frame relay.<sup>614</sup> E.spire/Intermedia argue that they are impaired without access to these data unbundled network elements to complete "virtual circuits" because they lack the incumbent LEC's economies of density and the ability to statistically multiplex data traffic to make efficient use of transport facilities.<sup>615</sup>

312. We reject e.spire/Intermedia's request for a packet switching or frame relay unbundled network element. First, as discussed above, we will define unbundled network elements, to the extent practicable, in a technologically neutral manner so as to not favor one particular packet switching technology over another. Defining an unbundled network element according to a particular packet switching technology, such as frame relay, violates this principle of technological neutrality. Furthermore, defining packet switching elements according to a specific technology creates the possibility that as innovative packet switching technologies are deployed, they may or may not fall within our definition of packet switching. Second, e.spire/Intermedia have not provided any specific information to support a finding that requesting carriers are impaired without access to unbundled frame relay. We note, however, that e.spire/Intermedia are free to demonstrate to a state commission that lack of unbundled access to the incumbent's frame relay network element impairs their ability to provide the services they seeks to offer. A state commission is empowered to require incumbent LECs to unbundle specific network elements used to provide frame relay service, consistent with the principles set forth in this order.

313. We do find, however, one limited exception to our decision to decline to unbundle packet switching. Access to packetized services to provide xDSL service requires "clean" copper loops without bridge taps or other impediments.<sup>616</sup> Furthermore,

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<sup>613</sup> e.spire/Intermedia Comments at 29.

<sup>614</sup> See Letter from John J. Heitmann, Counsel for Intermedia/e.spire, to Magalie R. Salas, Secretary, Federal Communications Commission, CC Docket No. 96-98 (filed July 21, 1999) (*Frame Relay and Data UNEs Ex Parte*).

<sup>615</sup> *Id.*

<sup>616</sup> See Ohio PUC Comments at 14-15; Covad Comments at 40; Northpoint Comments at 19; Rhythms Comments at 15-16.

xDSL services generally may not be provisioned over fiber facilities. In locations where the incumbent has deployed digital loop carrier (DLC) systems, an uninterrupted copper loop is replaced with a fiber segment or shared copper in the distribution section of the loop. In this situation, and where no spare copper facilities are available, competitors are effectively precluded altogether from offering xDSL service if they do not have access to unbundled packet switching.<sup>617</sup> Moreover, if there are spare copper facilities available, these facilities may not meet the necessary technical requirements for the provision of certain advanced services. For example, if the loop length exceeds 18,000 feet, the provision of ADSL service is technically infeasible. When an incumbent has deployed DLC systems, requesting carriers must install DSLAMs at the remote terminal instead of at the central office in order to provide advanced services. We agree that, if a requesting carrier is unable to install its DSLAM at the remote terminal or obtain spare copper loops necessary to offer the same level of quality for advanced services, the incumbent LEC can effectively deny competitors entry into the packet switching market. We find that in this limited situation, requesting carriers are impaired without access to unbundled packet switching. Accordingly, incumbent LECs must provide requesting carriers with access to unbundled packet switching in situations in which the incumbent has placed its DSLAM in a remote terminal. This obligation exists as of the effective date of the rules adopted in this Order. The incumbent will be relieved of this unbundling obligation only if it permits a requesting carrier to collocate its DSLAM in the incumbent's remote terminal, on the same terms and conditions that apply to its own DSLAM. Incumbents may not unreasonably limit the deployment of alternative technologies when requesting carriers seek to collocate their own DSLAMs in the remote terminal.

314. Policy Goals. Incumbent LECs argue in this proceeding that their incentive to invest and innovate in new technologies capable of providing advanced services will be curtailed if we mandate unbundling.<sup>618</sup> We note that investments in facilities used to provide service to nascent markets are inherently more risky than investments in well established markets. Customer demand for advanced services is also more difficult to predict accurately than is the demand for well established services, such as traditional plain old telephone service (POTS).

315. We acknowledge that the incumbent LEC argument that unbundling may adversely affect innovation is consistent with economic theory, but events in the marketplace suggest that other factors may be driving incumbent LECs to invest in xDSL technologies, notwithstanding the economic theory. For example, in January 1998, U S WEST announced a rollout of ADSL service to 40 in-region metropolitan areas.<sup>619</sup> In

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<sup>617</sup> Level 3 Comments at 23; NorthPoint Comments at 18-19; Rhythms Comments at 27.

<sup>618</sup> BellSouth Comments at 32-33; Bell Atlantic Comments at 43-45; U S WEST Comments at 57-58; SBC Comments at 74. We note that incumbent LECs made similar claims in response to our *Notice* in the Advanced Services docket. See *Advanced Services Memorandum Opinion and Order and NPRM*, 13 FCC Rcd 24012.

<sup>619</sup> See US West at <http://www.uswest.com/about/communicator/vol2no1/7.html> (US WEST launched ADSL service in 40 in-region metropolitan areas during the first half of 1998).

October 1998, BellSouth announced its plans to offer ADSL service to 1.7 million customers in 30 markets by the end of 1998, and 23 additional markets in 1999.<sup>620</sup> In January 1998, SBC announced a “massive rollout” of ADSL, “targeting more than 500 central offices and 9.5 million residential and business customers by year-end.”<sup>621</sup> In January 1999, Bell Atlantic announced plans to rollout ADSL service in several states and entered into a marketing alliance with America On-Line in which Bell Atlantic hopes, by the end of 1999 to make ADSL available to seven million subscribers.<sup>622</sup> Combined, Bell Atlantic and GTE have stated that the number of xDSL capable-lines available in region will be 17 million and they will have ADSL capability in 550 central offices, allowing them to serve as many as 6.1 million xDSL customers.<sup>623</sup> Such investments have been planned and undertaken notwithstanding the fact that we sought comment in August 1998 on whether facilities used to provide advanced services must be unbundled pursuant to section 251.<sup>624</sup>

316. Despite the encouraging signs of investment in facilities used to provide advanced services described above, we are mindful that regulatory action should not alter the successful deployment of advanced services that has occurred to date. Our decision to decline to unbundle packet switching therefore reflects our concern that we not stifle burgeoning competition in the advanced service market. We are mindful that, in such a dynamic and evolving market, regulatory restraint on our part may be the most prudent course of action in order to further the Act’s goal of encouraging facilities-based investment and innovation.<sup>625</sup>

317. Our overriding objective, consistent with the congressional directive in section 706, is to ensure that advanced services are deployed on a timely basis to all

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<sup>620</sup> See BellSouth Rolls Out ADSL to ISP, CLEC, & IXCs, RBOC Update, Oct. 1, 1998.

<sup>621</sup> See Telephony, CommunicationsDaily, Jan. 13, 1998. See also, *Bell Atlantic and SBC Push Merger Plans to Analysts*, CommunicationsDaily, Nov. 17, 1998.

<sup>622</sup> See Bell Atlantic to Offer Special ADSL Service for AOL, Comm. Daily, November 17, 1998 at 1.

<sup>623</sup> See CommunicationsDaily, July 21, 1999.

<sup>624</sup> See *Advanced Services Memorandum Opinion and Order and NPRM*, 13 FCC Rcd at 24054-63 paras. 92-115. Furthermore, it is widely believed that incumbent LECs’ recent moves to offer broadband to residential customers are primarily a reaction to other companies’ entry into broadband. In the 706 proceeding, U S West noted that when cable television-based broadband was available in three cities it served, it announced competing service in 14 states and 43 cities. Reply Comments of U S West Communications, Inc. filed in CC Docket No. 98-147, at 6 n. 9.

<sup>625</sup> The Commission emphasized the need for caution by regulators when it stated “we need to be particularly careful about any action we take to promote broadband deployment, given the nascent nature of the residential market for broadband. At this time, the dimensions of broadband and the upper limits of market-based supply and demand are unclear.” *Advanced Services First Report and Order and FNPRM*, 14 FCC Rcd. at 2436-37, para. 74.

Americans so that consumers across America have the full benefits of the “Information Age.” The advanced services marketplace is a nascent one. Although some investment has occurred to date, much more investment in the future is necessary in order to ensure that all Americans will have access to these services. We remain concerned about the lack of deployment in rural areas. We note that we will carefully monitor the deployment of broadband services to ensure that the objectives of section 706 and the Act are being met. We decline to unbundle packet switching at this time, except for the limited exception described above.

## E. Interoffice Transmission Facilities

### 1. Background

318. In the *Local Competition First Report and Order*, the Commission concluded that incumbent LECs must provide interoffice transmission facilities on an unbundled basis to requesting carriers. In particular, the Commission required incumbent LECs to provide dedicated and shared transport as an unbundled network element pursuant to section 251(c)(3).<sup>626</sup> The Commission found that such access was technically feasible and would promote competition in the local exchange market.<sup>627</sup> In that order, however, the Commission declined to address the unbundling of incumbent LEC dark fiber because the record provided insufficient evidence to decide that issue.<sup>628</sup>

319. In the *Notice*, we sought comment on the application of the “necessary” and “impair” standards to previously identified unbundled network elements, including interoffice transport facilities.<sup>629</sup> The *Notice* requested that parties include specific costs and an analysis of the availability of alternative sources of transport supply.<sup>630</sup> We also sought comment on whether, in light of technological advances or experience in the marketplace since adoption of the *Local Competition First Report and Order*, we should modify the definition of any of the previously identified network elements including, for example, the definition of “transport,” to include dark fiber.<sup>631</sup>

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<sup>626</sup> *Local Competition First Report and Order*, 11 FCC Rcd at 15717, para. 439. See also *Third Reconsideration Order*, 12 FCC Rcd at 12475, para. 25.

<sup>627</sup> *Local Competition First Report and Order*, 11 FCC Rcd at 15717-18, para. 439.

<sup>628</sup> *Id.* at 15722, para. 450. Dark fiber is deployed fiber optic cable connecting two points within the incumbent LEC’s network. It is “dark” because it does not have electronics on either end of the dark fiber segment to energize it to transmit a telecommunications service.

<sup>629</sup> *Notice* at para. 33.

<sup>630</sup> *Id.*

<sup>631</sup> *Id.* at para. 34.

320. Incumbent LECs generally argue that interoffice transport should not be unbundled where a single alternative source of transport is available.<sup>632</sup> Competitive LECs argue that because alternative sources of transport supply are largely unavailable, requesting carriers are impaired without access to unbundled transport.<sup>633</sup> Most of the state commissions addressing this issue agree that transport should remain an unbundled network element.<sup>634</sup>

## 2. Discussion

321. We find that requesting carriers are impaired without access to unbundled dedicated and shared transport network. In particular, self-provisioning ubiquitous interoffice transmission facilities, or acquiring these facilities from non-incumbent LEC sources, materially increases a requesting carrier's costs of entering a market or of expanding the scope of its service, delays broad-based entry, and materially limits the scope and quality of a requesting carrier's service offerings. Although the record indicates that competitive LECs have deployed transport facilities along certain point-to-point routes, the record also demonstrates that self-provisioned transport, or transport from non-incumbent LEC sources, is not sufficiently available as a practical, economic, and operational matter to warrant exclusion of interoffice transport from an incumbent LEC's unbundling obligations at this time. Accordingly, we conclude that incumbent LECs must offer unbundled access to their interoffice transmission facilities nationwide.

### a. Dedicated Transport

#### (i) Definition

322. In the *Local Competition First Report and Order*, the Commission defined dedicated interoffice transmission facilities as "incumbent LEC transmission facilities dedicated to a particular customer or carrier that provide telecommunications between wire centers owned by incumbent LECs or requesting telecommunications carriers, or between switches owned by incumbent LECs or requesting telecommunications

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<sup>632</sup> Ameritech Comments at 88; Bell Atlantic Comments at 30; BellSouth Comments at 53; GTE Comments at 10, 59; SBC Comments at 50.

<sup>633</sup> Ad Hoc Comments at 3; Cable & Wireless Comments at 37-38; Choice One Joint Comments at 14, 18; CoreComm Comments at 25; Excel Comments at 4; KMC Comments at 12, 15; MGC Comments at 2, 9, 21; NorthPoint Comments at 19; Net2000 Comments at 10, 14; Prism Comments at 17; TRA Comments at 12, 15;

<sup>634</sup> Connecticut DPUC Comments at 4; Florida PSC Comments at 11; Illinois Commission Comments at 13; Iowa Comments at 6-7; Kentucky PSC Comments at 2; Oregon PUC Comments at 2; Texas PUC Comments at 14.

carriers.<sup>635</sup> The Commission further concluded that incumbent LECs must provide all technically feasible capacity-related services such as DS1-DS3 and OC3-OC96 services.<sup>636</sup>

323. High-Capacity Transmission. We reaffirm that the definition of dedicated transport set forth in the *Local Competition First Report and Order* includes all technically feasible capacity-related services such as DS1-DS3 and OC3-OC96 dedicated transport services. We clarify that this definition includes all technically feasible capacity-related services, including those provided by electronics that are necessary components of the functionality of capacity-related services and are used to originate and terminate telecommunications services.<sup>637</sup> We find that unbundling high-capacity dedicated transport offerings will encourage competition and facilitate the deployment of advanced services. Unbundling high-capacity dedicated transport offerings also addresses claims by CompTel and other parties that non-incumbent LEC facilities cannot provision sufficient bandwidth for data-intensive services.<sup>638</sup> Accordingly, we modify section 319(d)(ii) of our rules to clarify that incumbent LEC must unbundle DS1 through OC192 dedicated transport offerings and such higher capacities as evolve over time. Our intention is to ensure that the definition of interoffice transmission will apply to new, as well as current technologies, and to ensure that competitors will continue to be able to access these facilities as unbundled network elements as long as that access is required pursuant to section 251(d)(2).

324. Notwithstanding the fact that we require incumbents to unbundle high-capacity transmission facilities, we reject Sprint's proposal to require incumbent LECs to provide unbundled access to SONET rings.<sup>639</sup> In the *Local Competition First Report and Order*, the Commission limited an incumbent LEC's transport unbundling obligation to existing facilities, and did not require incumbent LECs to construct facilities to meet a requesting carrier's requirements where the incumbent LEC has not deployed transport facilities for its own use.<sup>640</sup> Although we conclude that an incumbent LEC's unbundling

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<sup>635</sup> *Local Competition First Report and Order*, 11 FCC Rcd at 15718, para. 440.

<sup>636</sup> *Id.*

<sup>637</sup> Incumbent LECs often deploy equipment such as the NEC RC-28D, Lucent DDM2000 and GR-303 to provide capacity-related services. See BellSouth Comments, Attachment A at 1.

<sup>638</sup> For example, in Atlanta, Allegiance argues that the sole alternative transport network serves only three incumbent LEC central offices and that the provider is unwilling or unable to provision sufficient bandwidth to meet Allegiance's requirements. Allegiance Comments at 19. See also Covad Comments at 47 (requesting that the Commission recognize that interoffice bandwidth is not unlimited and given Covad's bandwidth requirements, there will be an insufficient supply of interoffice transport if an incumbent LEC is no longer required to unbundle transport); CompTel Comments at 42 (requesting unbundled access to high-capacity or packet transport services.)

<sup>639</sup> Sprint Comments at 38.

<sup>640</sup> *Local Competition First Report and Order*, 11 FCC Rcd at 15722, para. 451.