

used to supplement market evidence on the issue of a CLEC's ability and incentive to expand its network.

25. AT&T grossly mischaracterizes my model to try to poke holes in my breakeven analysis. For example, AT&T suggests that the breakeven model assumes "that the competitive IFC does not have to expend capital before it is able to generate revenues from its new

[REDACTED]

27. Finally, the Commission should be reassured that my analysis replicates the calculus used by “real-world” CLECs, such as WorldCom. In fact, CSMG has designed the business plans of over 50 “real-world” CLECs. Moreover, according to Edwin A. Fleming, Senior Manager of Strategic Business Planning for WorldCom, WorldCom uses the *same* calculus when deciding whether to extend its network:

For larger buildings where WorldCom projects WorldCom customer demand of several DS-3s or optimal level circuits, the building add decision is made using a screening process that compares projected revenues to the cost of the building add and that also takes into account the risk that revenues will be lower than projected.<sup>49</sup>

WorldCom’s explanation is consistent with my breakeven analysis, and provides further support for use of the model.

1. **The Opponents Incorrectly Claim That the Breakeven Model Understates the Cost of Extending the Network**
  - a. **Contrary to the Assertions of AT&T, Common Costs Should Not Enter the CLEC’s Decision to Expand Its Existing Network**

28. AT&T faults my “incremental” approach to model a CLEC’s decision to expand its existing fiber network. In particular, AT&T claims that the breakeven cost model does not take into consideration any of the “significant costs of the fiber backbone and associated electronics,” or the “necessary back office systems and unused network capacity to handle all the incremental special access traffic.”<sup>50</sup> That critique is flawed for at least two reasons. *First*, the CSMG model includes costs associated with the network electronics that are directly attributable

network to handle the traffic associated with *one* additional building. Given the glut of fiber capacity, this assumption seems very reasonable.<sup>51</sup>

**b. Contrary to the Assertions of AT&T and WorldCom, CSMG Did Not Underestimate the Trenching Costs**

31. AT&T notes that the Commission independently determined trenching costs to be between \$27.79 and \$42.59 per foot for generically defined dense urban areas.<sup>55</sup> CSMG, however, was asked to determine the costs for the *specific* markets studied after discussing the issue with contractors and city officials. Some particularly dense cities with unusual terrain, obstacles, and high labor costs certainly will entail higher costs, in line with the Commission's estimates. It should be noted, however, that cities with higher trenching costs are likely to have higher revenue opportunities.

32. In any event, AT&T's argument proves little because the breakeven model is relatively insensitive to trenching costs. For example, if the CSMG trenching costs are increased by nearly 100 percent (from \$34.16 to \$60.59 per foot), the net effect on the revenue breakeven frontier at 500 feet is an upward shift of only 4.6 percent to 7.8 percent for the various markets. According to a sensitivity analysis, I find that such a change in the breakeven frontier does not significantly alter my conclusions.<sup>56</sup>

**c. Contrary to the Assertions of AT&T and WorldCom, the Straight-Line Assumption on Connecting Buildings to Nearest Fiber Lines Does Not Significantly Affect the Breakeven Revenues**

33. AT&T and WorldCom assert that the assumption about straight-line connections between off-net buildings and existing CLEC fiber networks dramatically impacts the breakeven

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55. AT&T "Economic" Study, *supra* note 1, at 21. WorldCom also accuses CSMG of underestimating trenching costs. See *Fleming Declaration*, *supra* note 29, at ¶ 18 (arguing that "trenching costs in the central business districts of major cities are often much higher, at least \$70 to \$100 per foot."). See also Comments of Yipes Transmission, Inc., at 13 (July 11, 2001) ("[T]he BOCs grossly underestimate the cost of [trenching] fiber facilities.").

calculations: “In reality, public rights of way run parallel to streets and rarely run in a straight line from a particular building to a competitive LEC’s backbone fiber.”<sup>57</sup> This assertion is overstated for two reasons. *First*, while it is true that lateral extensions are not always built as-the-crow-flies, straight-line distance can be used as a simplifying assumption. Given the grid layout of the streets in the urban environment where these customers are found, and given that the CLEC can choose where the extension will join the existing network, it is likely that the vast majority of extensions will run straight down a side street to the new customer’s location.<sup>58</sup>

increased by 20.7 percent.<sup>59</sup> I have asked CSMG to assess the effect of this modification on the CSMG cost model. According to their sensitivity analysis, the effect of using 1,207 feet instead of 1,000 feet as the length of the lateral extension connecting a building to the fiber ring increases the required breakeven revenue for that building by only 2 to 3 percent across the different markets.

**d. Contrary to the Assertions of AT&T and WorldCom, the CSMG Model Does Not Understate Capital Expenditures**

35. AT&T's comments on the capital expenditures (capex) required to build out a fiber lateral extension intimate that CSMG's cost assumptions are too low for each component.<sup>60</sup> In fact, when the total capex cost of the lateral is examined at the fiber distance of one mile, the results fall within the boundaries of universally accepted industry benchmarks. According to CSMG, its CLEC clients typically budget \$100,000 to \$200,000 per mile for their 100 percent underground fiber lateral builds.<sup>61</sup> Indeed, according to at least one opponent of the joint petition, underground fiber deployment costs range from \$100,000 to \$300,000 per mile.<sup>62</sup> The CSMG model calculates the total fiber lateral capex requirements per mile (assuming a certain mix of underground and aerial cable) for the specific markets studied as follows: Cleveland: \$183,000; Dayton: \$135,000; Greenville: \$113,000; St. Paul: \$171,000; Seattle: \$199,000; and Tucson:

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59. Using the Pythagorean theorem, the length of the hypotenuse of a triangle with each side equal to one foot is 1.41 feet. For the purpose of this sensitivity test, we assume that half of all extensions are represented by the hypotenuse of the triangle.

60. AT&T "Economic" Study, *supra* note 1, at 21. WorldCom asserts, without any corroboration whatsoever, that the average cost of its "most recent" building adds were \$250,000. *See Fleming Declaration, supra* note 29, at ¶ 8.

61. WorldCom claims that, if it were forced to spend \$115,000 to reach an "off-net" building, its ability to supply special access service would be impaired. *WorldCom Comments, supra* note 2, at 25 (explaining that "costs of this magnitude contribute to a finding of impairment.").

62. *See, e.g.,* Comments of AES Communications L.L.C., at 12 (filed June 11, 2001).

\$128,000. Hence, CSMG's estimates of capital expenditures are within the range of accepted industry benchmarks.

**2. The Opponents Incorrectly Claim That the Breakeven Model Overstates the Revenues That a CLEC Could Expect to Capture**

**a. Contrary to the Assertions of AT&T, A Building That Is Estimated to Be Slightly Above the Breakeven Frontier Would Not Be Just as Likely To Be Below the Frontier**

36. AT&T is forced to invent a new theory of statistics to critique my revenue-forecasting model. In particular, AT&T incorrectly suggests that the revenue estimates for the buildings in the six sample cities are distributed *uniformly* across every value inside the confidence interval. Indeed, for a given building with a revenue estimate above the breakeven frontier, AT&T implies that so long as the confidence interval of the revenue estimate contains a *single* point below the breakeven frontier, that building is just as likely *not* to be served by a CLEC:

In particular, the low values of the t statistics indicate that the revenue estimates from the OLS model have large confidence intervals around them and all revenues within a confidence interval have equal statistical validity. That means that when Dr. Crandall used the point estimate in the middle of the confidence interval, the revenues at the bottom and top of the interval have equal statistical validity.<sup>63</sup>

Contrary to AT&T's assertion, the revenue estimates of the OLS model represent the *most* likely outcome in the confidence interval—not one of many equally likely outcomes. Indeed, the possible outcomes of predicted revenues are distributed according to a *normal* distribution, the mass of which is built around the mean—not according to a uniform distribution.<sup>64</sup> Hence, as a

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63. AT&T "Economic" Study, *supra* note 1, at 37.

64. GREENE, *supra* note 39, at 262-65.

matter of statistics, AT&T is wrong to assert that any revenue estimate (above, on, or below the breakeven frontier) is equally likely.

**b. Contrary to the Assertions of AT&T, the Breakeven Model Does Not Uniquely Assume That CLECs Gain 100 Percent of a Building's Revenues**

37. AT&T also wrongly asserts that, to obtain the desired results, my analysis must assume that the nearest CLEC obtains 100 percent of the building revenues.<sup>65</sup> However, my breakeven model makes no such assumption. To the contrary, I performed a sensitivity analysis of the percentage of buildings and building revenues that remained above the breakeven frontier

- The model considered each building as if it were a *stand-alone* investment. In reality, a CLEC would decide to expand its network down a given street based on the expected revenues from multiple buildings on that street—not just one building. Hence, an extension to a single building above the breakeven frontier might allow the carrier to reach multiple buildings below the breakeven frontier.<sup>69</sup> Moreover, extending the network to multiple buildings yields considerable cost savings, and hence lowers the breakeven frontier for any given building.<sup>70</sup>
- The model *excluded* potential revenues from local-switched basic. The revenue figure contains only five components: (1) local non-switched; (2) local switched hi-cap; (3) regional toll; (4) long-distance; and (5) international long-distance.
- The model assumes *no growth* in revenues during the first five years of the customer relationship. In particular, CSMG has assumed building revenues remain constant in perpetuity for the net present value calculation—despite the fact that building revenues have historically seen strong growth and are forecasted to continue to grow substantially over the next decade.
- The model assumes no use of ducts or conduits supplied by ILECs or third parties, thereby ignoring potential cost savings from avoiding trenching. Moreover, it assumes almost all fiber will be placed underground, although CLECs often use cheaper aerial alternatives.

Hence, similar results could have been obtained with a less aggressive assumption on the percentage of captured revenues but a more aggressive assumption on revenue growth, the components of total revenues, or interrelated expansion decisions.

39. More importantly, AT&T misses the larger point of my analysis. There is no magical percentage of revenues from profitable off-net buildings above which the powers of competition are unleashed. Rather, the breakeven analysis is intended to show that the CLECs' vitality in extant special access markets is only a starting-point for more vigorous competition in

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69. For example, where buildings are clustered close to each other, the investment in equipment placed in one building can be used to serve the neighboring buildings.

70. For example, suppose that five buildings were arrayed along a side street and that each of the buildings was above the breakeven frontier. In my model, the CLEC would have paid five sets of permitting fees, and would have paid the fixed costs of trenching five times over. Clearly, this overstates the costs that a CLEC would incur to serve those five customers with a single lateral route.

the future; CLECs can profitably serve a significant number of off-net customers in the future without access to ILECs' facilities.

**c. Contrary to the Assertions of AT&T, the Breakeven Model Does Not Use an Inflated Terminal Value**

40. According to AT&T, the CSMG methodology is a "gimmick" because it relies on an inflated terminal value.<sup>71</sup> A "terminal value" is the value of the company's cash flows beyond the explicit forecast period.<sup>72</sup> To the contrary, CSMG developed its model based on standard industry assumptions of terminal value.<sup>73</sup> For example, business managers regularly estimate acquisition prices and value private equity placements according to CSMG's valuation methodology slightly adjusted by the nuances of specific situations. The CSMG model assumes

### III. THE OPPONENTS SEEK TO CONFOUND THE IMPAIRMENT DECISION WITH SUPERFLUOUS INFORMATION

#### A. A Handful of Anecdotes Cannot Substitute for Comprehensive Market-Based Evidence

41. As a substitute for “theoretical modeling,” the CLECs offer a handful of anecdotes that attempt to prove that CLECs are impaired in the delivery of special access services without access to ILEC facilities. For example, AT&T cites several incidental factors that impair its “ability to deploy its own facilities,” including building access issues and term commitments of customers.<sup>74</sup> Certainly every facilities-based CLEC believed it was possible to overcome lengthy term commitments or hostile landlords<sup>75</sup> before investing considerable resources in special access facilities. If such obstacles were really impossible to navigate, as suggested by AT&T, then no CLEC would have incurred the risk to develop its own network. Moreover, factors such as term commitments would represent an obstacle even to a CLEC using UNEs. Those obstacles, to the extent that they exist, are thus irrelevant to the question of whether UNEs should be available. The bottom line is that such anecdotal evidence—or what AT&T calls “hard factual evidence”<sup>76</sup>—cannot refute the systematic evidence of CLEC facilities-based deployment.

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74. AT&T “*Economic*” Study, *supra* note 1, at 12.

75. AT&T claims that municipalities and landlords often demand “exorbitant” fees. *Id.* at 22. In fact, CSMG interviewed city officials in every market it studied as well as building owner/operators and found that (1) the municipality fees are codified in municipal regulations and are easily calculated and understood on the outset, and (2) building owner/operators have considerably less negotiating power now than they may have wielded even six months ago. Building owners need to compete for tenants by offering the availability of high-capacity services and are in no position to extract fees from the providers of those services.

76. *Id.* at 13. Ironically, some of my opponents accuse me of relying on anecdotal evidence. *See, e.g., Conversant Comments, supra* note 65, at 27 (“The Crandall Declaration introduces a large amount of anecdotal evidence, such as CLEC/IXC press releases and newspaper articles. . . . [T]he anecdotal evidence presented in

**B. AT&T and WorldCom Incorrectly Suggest That Capital Market Imperfections Should Inform the Commission's Impairment Decision**

42. AT&T and WorldCom also suggest that the Commission should consider capital market imperfections when it makes its impairment decision.<sup>77</sup> According to WorldCom, the only thing that “*has* changed in the eighteen months since the Commission adopted the UNE Remand Order is that the capital markets have closed to the CLECs.”<sup>78</sup> As I demonstrate below, the capital markets are still open to CLECs, but creditors are now scrutinizing the CLECs’ business plans more thoroughly. During the technology bubble of 1998 through 2000, CLECs could raise capital for *any* business plan with the greatest of ease.<sup>79</sup> According to J.P. Morgan and McKinsey & Co., at least 50 companies, offering a range of Internet backbone services, joined the “gold rush” by the end of 2000.<sup>80</sup> Because investors in 2001 are less willing to gamble on all CLEC plans (both good and bad), the Commission’s unbundling rules are even more critical in restoring the faith of suspecting creditors—that is, in a climate of greater scrutiny, creditors will be even less willing to invest in CLEC facilities-based plans if low-cost UNE alternatives are available. The opponents’ characterization of the capital market and its relationship to the impairment test is flawed for several reasons.

43. *First*, contrary to the commenters’ assertions, the capital markets have not closed to CLECs—several CLECs continue to receive funding and deploy facilities-based networks. A

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review of 10-Qs filed at the Securities and Exchange Commission in May 2001 reveals that several CLECs continued to deploy local networks during the first quarter of 2001 and plan to extend those networks throughout 2001.<sup>81</sup> In addition, this summer's newspapers are filled with stories about CLECs' plans to expand their local networks.<sup>82</sup> According to Credit Suisse First Boston, aggregate capital expenditure for the major CLECs in 2001 is predicted to *exceed* the actual level of capital expenditure in 1999.<sup>83</sup> In addition, as of June 21, 2001, the valuation of

and CLECs' plans to expand their local networks.<sup>82</sup> According to Credit Suisse First Boston, aggregate capital expenditure for the major CLECs in 2001 is predicted to *exceed* the actual level of capital expenditure in 1999.<sup>83</sup> In addition, as of June 21, 2001, the valuation of

relevant information into the pricing of a firm's risk. They do not ignore pertinent information or penalize a firm for non-economic considerations—such behavior would create arbitrage opportunities that would disappear instantaneously. The capital markets can distinguish between CLECs with compelling, long-term investment opportunities and CLECs with risky, short-term arbitrage opportunities.<sup>85</sup>

45. In summary, AT&T and WorldCom would have the Commission believe that capital markets can shut down entirely a CLEC's access to funding. To the contrary, each CLEC—even those that failed miserably—has access to capital at a continuous (as opposed to a discrete) rate, which depends on the CLEC's perceived riskiness. Even if it is convinced that the capital markets have unjustly punished CLECs as a class, the Commission should not play the role of central banker.

**C. AT&T Incorrectly Suggests That Customer Perceptions of CLEC Quality Should Inform the Impairment Decision**

46. AT&T also suggests that customer intransigence would *never* allow CLECs to compete on a level playing field against ILECs:

Competitive LECs face the reality that no one has ever been fired for buying access from the incumbent LEC, and many customers are unwilling to take the (perceived) risk of using competitive LEC facilities, even if they offer generally superior performance and lower price.<sup>86</sup>

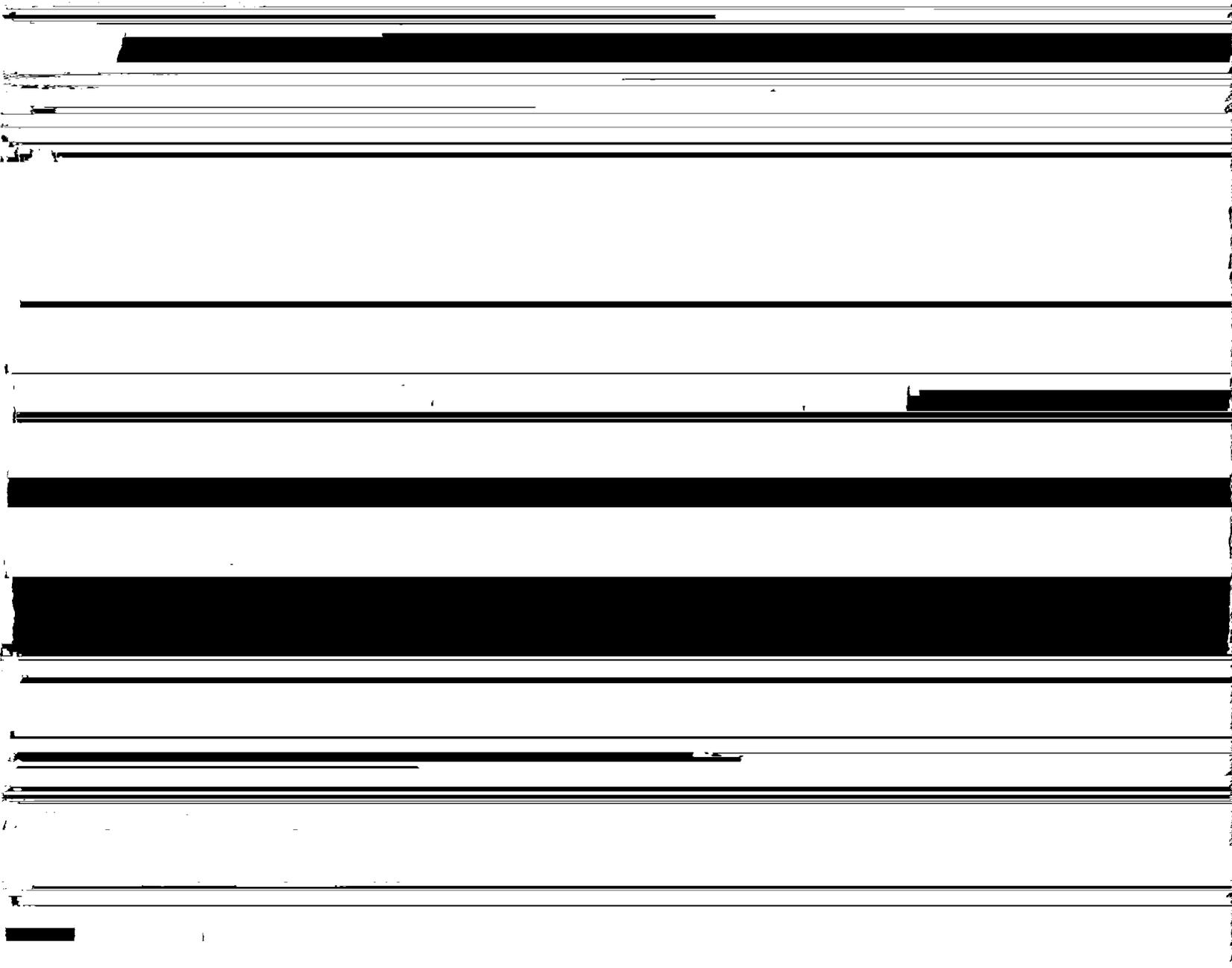
The Commission should disregard such unsupported rationalizations when making its impairment decision. As an initial matter, AT&T's argument is disingenuous, at best, given that AT&T scoffed at similar arguments about excessively risk-averse customers when its own

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85. For example, XO Communications raised \$250 million in equity in April 2001 to expand its network. See Richard Waters, *Companies and the Finance of America*, FIN. TIMES, Apr. 27, 2001, at 36.

86. AT&T "Economic" Study, *supra* note 1, at 12.

regulatory status was at issue ten years ago. Responding to claims that customers would be unwilling to risk leaving AT&T for a competitor, AT&T noted that “[t]he rapid decline in AT&T’s market share in a very short period of time demonstrates that customers can and do switch carriers.”<sup>87</sup> In particular, it argued that “large and sophisticated buyers are aware that there are other carriers, in addition to AT&T, who claim to offer a wide range of competitive services at attractive prices. These buyers have the incentive and ability to assess the quality of the services they are offered, and to choose among them based on their merits.”<sup>88</sup>



and CLECs are vanishing. Hence, these factors should not be considered in the Commission's impairment decision.

48. With respect to those CLECs that are truly unknown, customer intransigence still should not enter the impairment decision. Assume, as AT&T alleges, that certain businesses are reluctant to purchase telecommunications services from a lesser-known CLEC. From that (dubious) assumption, it is impossible to conclude that those same customers would be *more* likely to purchase special access from a lesser-known CLEC simply because that CLEC could lease the loop from the ILEC.

**D. WorldCom Incorrectly Suggests That Month-Long Delays in Self-Provisioning “Off-Net” Customers Justifies Unbundling of High-Cap Loops and Transport**

49. According to WorldCom, adding a new building to an existing CLEC network “takes between six and nine months,” thereby making it “impossible for the CLEC to compete for a customer.”<sup>92</sup> WorldCom then compares that time frame to the “20 days” required for an ILEC to offer similar services. The relevant time horizon within which the Commission considers impairment cannot be as short as six months. For all customers who reside in a building that is currently passed by at least one CLEC fiber network, the *relative* wait in using a CLEC for special access service is zero. I expect the relative wait for the majority of special access customers to disappear as the CLECs continue to expand their networks to reach “off-net” customers over the next two years. WorldCom's argument about how long it takes a specific CLEC to serve a specific “off-net” customer who demands service today is therefore not only unproven, it is irrelevant.

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92. *WorldCom Comments*, *supra* note 2, at 13.

50. AT&T makes a very different argument from that advanced by WorldCom. AT&T explains that a customer could not be transitioned from a special access arrangement to the carrier's own facility. If this were true, however, then the same problem would arise when the CLEC tried to transition the customer from a UNE-based arrangement to its own facility. Hence, AT&T's real concern is not with the time required to build facilities, but with the price of the ILEC facilities that it might choose to employ in the interim.

51. In any event, under WorldCom's theory, unbundling would be required in perpetuity. If the delay associated with an incremental network buildout constitutes impairment, then CLECs would continue to be impaired until new networks were fully built out. But that, of course, would never happen if UNEs were available because CLECs would have diminished incentives to invest in their own facilities.

**E. The Opponents Incorrectly Argue That CLECs Need Access to ILEC Facilities at TELRIC Prices To Avoid the Impairment of Competition**

52. If the Commission determines that CLECs are no longer impaired without access to ILECs' high-cap loop and transport facilities, then CLEC facilities-based investment will increase relative to its current pace. According to WorldCom, the only thing that prevents it from investing in its own facilities is the lure of a free ride:

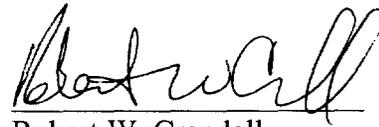
For such typical buildings, a CLEC's per DS-1 cost of self-provisioning would be very high because the CLEC might win only a portion of the building's demand and would incur costs of \$250,000 or more even in those cases where the CLEC had an existing ring nearby (and substantially more in those cases where the CLEC had to build a new fiber ring). By contrast, the cost of obtaining an unbundled DS-1 loop from the ILEC is between \$60 and \$100 per month.<sup>93</sup>

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93. *Id.* at 11.

WorldCom essentially admits that the UNE rate, which is intended to serve as a proxy for the long-run incremental cost of providing the element for an efficient firm, is set too low! I demonstrated in my original declaration that a vast majority of off-net customers could be profitably served by CLECs with nearby fiber networks. But until the Commission takes away that free ride, a large percentage of those off-net customers will be dependent on a single facilities-based carrier.

I declare under penalty of perjury, that the foregoing is true and correct to the best of my knowledge and belief.

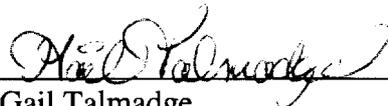
A handwritten signature in black ink, appearing to read "Robert W. Crandall", written over a horizontal line.

June 25, 2001

Robert W. Crandall

**CERTIFICATE OF SERVICE**

I, Gail Talmadge, do hereby certify that on June 25, 2001 a copy of *Reply Comments of the United States Telecom Association* in CC Docket No. 96-98, was either hand-delivered or sent via U.S. Mail, first-class, postage prepaid, to the persons on the attached service list.

  
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