Q. Would you please elaborate on the effects of competition as they relate to the Company's proposed price regulation plan?

A. Yes. While it is clear that competition produces many benefits--increased customer choice, increased pressures for maximum efficiency, etc.--it should also be recognized that it can have negative effects on the incumbent carriers and their captive customers, at least in the short run. For one thing, competition slows the incumbent's growth rate as its market share declines, reducing the benefits of economies of density and scale, and the growth in revenues and profits just discussed. Furthermore, competitive pressures will tend to be strongest where margins are perceived to be the highest and/or barriers to entry are the lowest. These factors tend to create strong incentives for the incumbent carrier to reduce prices in the markets where margins are high, or barriers to entry are low, or both. Conversely, where competitive pressures are weakest, either because margins are lower, or because barriers to entry are higher, or both, the incumbent may attempt to *raise* prices. That is, the unevenness of competitive pressure may encourage the incumbent carrier to "rebalance" rates in an effort to sustain profitability in the face of price reductions in the more competitive markets.

Q. Assuming barriers to entry exist in some areas, how does this cause prices to rise?

A. Consider, for example, the situation where small carriers will incur relatively high average costs if they attempt to enter smaller markets, because the market isn't large enough for a small carrier to gain the benefits of economies of scale and density. In this situation, carriers will be less likely to enter the smallest markets. The problem is most acute in rural areas and for very small carriers (e.g. a 5% market share). In such

circumstances, the incumbent may have an incentive to increase its prices in these markets, perhaps stopping just short of the point where he estimates a potential entrant's average costs would be. This is sometimes referred to as the entry-deterring pricing (maximize profits subject to a constraint of not enticing competition into the market). Simply stated, without regulatory constraints and without effective competition, if the incumbent is free to charge "what the market will bear," it will have an incentive to greatly increase rates in rural markets relative to urban markets, where barriers to entry are lower.

Q. Have you prepared any cost studies to examine the relationship between carrier size, market size, and costs?

A. Yes. We have prepared a series of cost studies which provide useful information concerning the potential for competitive entry within the areas served by typical North Carolina wire centers, and which provide some indication of the type of rate rebalancing that the Company may initiate once it is given additional pricing flexibility.

For convenience, I will refer to the customers who would presumably be on the network even in the absence of pricing policies designed to advance the goal of universal service as the core group of customers. I will refer to the additional customers who can be enticed onto the network through carefully crafted pricing and regulatory policies as the "marginal" or "incremental" customers. For the purpose of developing these cost estimates, I have assumed the latter group includes half the existing residential customers. However, the exact percentage is not critical to this analysis; the results would be similar if a slightly different increment were analyzed.

Each page of Schedule 7 corresponds to a different size carrier. In each case, the first column of data is the estimated total cost of serving core customers in the wire center--including all of the business market and half the residential market. The second column reflects the total cost of serving all types of customers, including both the core segment and the marginal (price sensitive) segment.

The third column provides an estimate of the "Total Service Long Run Incremental Cost" (TSLRIC) of serving these marginal residential customers. TSLRIC is defined as the difference between the total cost of providing all of the firm's products excluding the service in question and the total cost of providing all these products including the service in question (a full discussion of various cost approaches is provided in Appendix B). The approach used in our model directly corresponds to this definition of TSLRIC. The model designs a network and computes total cost excluding the defined incremental service; then it does the same thing including the service; then finally it compares the two totals. This difference in total costs is the TSLRIC of the service in question. In other words, the model directly estimates the total cost differential that results from the difference in network configurations and output levels.

As I explain in greater detail in Appendix C, I used our model to estimate the total cost of two networks--one that only serves the core customers, and one that serves both the core customers and the marginal customers. The total costs of these two networks is shown in the first and second columns. The total incremental cost of the loops required to serve the marginal customers can be calculated as the difference between the total cost of configuration one and the total cost of configuration two. For example, in the average wire center, for a carrier with 100% of the market, the monthly cost increases from $89,363 to $115,530 as the situation changes from a network that

serves only core customers to one that serves nearly everyone. The added cost the carrier incurs in order to serve the marginal market segment is $26,166 per month.

Q. What do your cost estimates indicate about the likely pattern of competitive entry?

A. I have prepared cost estimates for a competitive carrier with a 20% share of each market segment. Thus, for example, in Schedule 7 page 2, column one assumes the carrier is serving 20% of the business customers and 20% of the core residence customers, while in column two it serves 20% of the entire market, including the marginal residence customers. I have also prepared estimates for an even smaller carrier, serving just 5% of each segment.

Perhaps our most significant finding is that a small competitive carrier could be reluctant to serve low density areas, because its average cost per loop will be high, relative to the average level of revenue it can reasonably anticipate generating. A carrier will enter a market only if it expects its total revenues to exceed its total costs. Another way of stating this is that the entrant must anticipate average costs that are less than the average revenues it anticipates generating. Page 2 of Schedule 8 shows average cost levels for the carrier with a 20% market share, while page 3 shows the analogous figures for the even smaller carrier, and page 1 shows a carrier with 100% market share.

In reviewing these cost figures, it becomes apparent that a carrier which expects to achieve a 5% share of the market is not likely to build its own loop network--particularly in low density areas--because its average costs will be far above the revenue level it can realistically anticipate. Even in the urban area, a small carrier will

probably not find it cost-effective to install its own loop network if its anticipated market share is as low as 5%. Accordingly, these cost estimates suggest that unless the market expands considerably (e.g. with video dial tone), cost conditions will continue to impose a barrier to entry into the local exchange market--at least for very small competitive carriers in rural areas and small towns.

One could argue that even the carrier with a 20% market share will experience relatively high costs, and thus may be reluctant to compete against an incumbent with a much larger share of the market. However, this is not necessarily the case. For example, the incumbent already has a network in place, and it consists almost entirely of analog copper loops, but an all-fiber, all-digital network is clearly a viable option for a new carrier starting from scratch. If the carrier selects this technology, its costs will be only moderately higher than if it builds a copper network, yet it may be able to generate substantial additional revenues from other services, like video dial tone.

As with the copper network, the smaller carriers' total and average costs for mixed and all-fiber networks are quite high--particularly when compared to those incurred by the incumbent carrier with its much higher volume of output. Nevertheless, from the perspective of a new entrant, the choice of technology must be considered in a strategic context. A digital, all-fiber network may be preferred by a new entrant, despite its high cost, if the incumbent has not yet upgraded to a digital network. The all-fiber technology would help a new entrant gain market share, allowing it to claim that it offers superior quality. More significantly, the fiber network offers the potential to generate substantial additional revenues from video and other broadband services.

Q. Please explain further this potential for additional revenues from video dial tone. If this service proves feasible from both technical and marketing perspectives, what will be the impact on the cost of providing basic voice grade telephone service?

A. Clearly, it will drive down total and average costs. The only uncertainty is the degree and timing of this reduction in cost levels. While BellSouth has been relatively quiet about its video dial tone plans, its neighboring LEC, Bell Atlantic, has announced that it plans to offer its customers high-quality video services on demand, using a full 45 megabits of bandwidth. This is equivalent to 672 voice grade circuits going into a single household. Even without any further improvements in technology, or further reductions in the cost of the electronic equipment used to transmit voices and video pictures over a fiber network, the tremendous increase in traffic levels required to handle this quality of video service will translate into a very substantial reduction in cost levels for ordinary voice grade services.

Significantly, it appears that Bell Atlantic is anticipating a substantial drop in the cost of deploying a broadband, all-fiber, digital network over the next decade. If this does occur, the cost of providing ordinary voice grade services over this same network will decline even further over this time frame. Since a large fraction of the costs of a broadband network consists of electronic equipment that relies upon computer technology, and the cost of this type of technology continues to decline rapidly, it is not unreasonable to assume that costs will substantially decline over the time period required to implement their plan. In turn, the cost of providing basic universal service will also decline, since much of the technology is also applicable to ordinary voice grade services.

Q. What cost and revenue assumptions underlie the "Video" figures included in Schedules 7 through 10?

A. We were conservative in modeling the combination of video dial tone with traditional voice grade services over the same loop network. We did not assume any substantial reduction in the cost of the electronics needed to deploy "fiber to the curb," although such reductions are anticipated by many industry observers. Further, we assumed that the carrier would provide video services using just 5 megabits of capacity per household. In contrast, Bell Atlantic has announced that it intends to offer a full 45 megabit video service to its residential customers. Also, we assumed that there would be no expansion of the volume of business services sold (none of the business customers would use video dial tone or increase their use of high bandwidth data services). Finally, we assumed that video dial tone would be positioned as a high priced premium product, purchased by just 10% of the residences.

In my opinion, these are extremely conservative assumptions. If we had been more realistic in our assumptions--particularly with regard to the declining cost of digital equipment--the cost of providing basic voice grade service would be even lower than we have estimated.

Q. Would you please explain how the cost figures you have presented support your contention that a price cap system should include relatively tight constraints on local rates?

A. Certainly. First, our studies verify, among other things, that telecommunications is a declining-cost industry in which carriers benefit from increasing economies of scale, density, and scope as the market expands. However, these economies are a two-edged

sword under the factual circumstances present in this proceeding: on the one hand they reduce per-unit costs over time; on the other hand, they discourage competitive entry by smaller carriers into small town and rural areas, where the advantages of scale and density are not readily available to very small carriers. Thus, if the Company is given too much freedom to "rebalance" its rates, the resulting rate changes may not be in the public interest.

Moreover, as shown on Schedule 11, the costs of serving a typical residential or business customer are relatively similar, yet the revenues are quite different. Primarily due to substantial differences in the local rate schedules, the typical business line produces substantially higher revenues, and thus provides contributions (profits) that are almost double the amount generated by the typical residential line. Under these circumstances, there is reason to anticipate strong competitive pressures in the business market segments, with a corresponding incentive for the incumbent carrier to "rebalance" at least some of its residence rates upward.

Consider the summary table below, which focuses on a potential entrant that anticipates serving 20% of the market using an all-fiber network.

Competitive Carrier 20% Market Share	Zones 1&2 Average Cost	Zone 1 Average Cost	Zone 2 Average Cost
Core Customers			
Rural-All Fiber	323.49	207.14	386.65
Small Town-All Fiber	44.81	31.29	52.17
Urban-All Fiber	16.04	13.14	17.64
Average-All Fiber	32.05	23.26	36.85
All Customers			
Rural-All Fiber	210.12	143.49	242.94
Small Town-All Fiber	31.84	24.16	35.62
Urban-All Fiber	13.46	11.74	14.31
Average-All Fiber	23.70	18.62	26.20
Marginal Customers			
Rural-All Fiber	8.59	6.73	9.35
Small Town-All Fiber	8.28	8.39	8.23
Urban-All Fiber	8.11	8.02	8.15
Average-All Fiber	8.18	8.02	8.25

This carrier would see considerable opportunity to profitably enter the highest density markets. For instance, if it only targets the core customers in the urban wire center within zone one, its average loop costs will be just $13.14 per month. While various other costs must also be incurred to serve these customers (e.g. switching, marketing, billing and collection), it is likely that a profitable entry strategy can be developed, considering the average revenues per line which are generated by the core customers--particularly larger business customers. Interestingly, once the carrier decides to serve the urban market, it may also attempt to gain market share within the marginal customer

segment, since the incremental cost of serving this group is not very high--given the basic infrastructure is in place to serve the core group of customers.

However, the opportunities are not as attractive in the lower density markets. In the rural market, for instance, the carrier faces average costs per loop of $143.49 per month, even if it "cream skims" and only serves zone 1. Narrowing the focus to just the core group of customers doesn't solve the problem. With a market share of just 20%, there just aren't enough core customers to cover the fixed infrastructure costs, and thus the average cost per loop is $207.14 per month in the rural wire center, zone 1.

Each carrier, and each wire center, involves unique circumstances, and thus one cannot necessarily conclude that no competitors will ever enter the rural markets. But, it is fair to say that the cost characteristics of the industry currently impose higher barriers to entry in low density markets--particularly in rural areas. Hence, one can anticipate that incumbent carriers like the Company will face greater competitive pressures in higher density areas, and they will have an incentive to raise prices in the lower density areas, where the competitive pressures are not likely to be as intense.