2. The Value of Cost Modeling

Q. Please turn to the second section of your testimony. Is the Commission correct in requiring nonrural ILECs to submit forward-looking cost studies rather than embedded studies in this proceeding?

A. Yes. This type of information is absolutely vital, particularly in the context of universal service funding. There are at least four reasons why embedded data will not be adequate, and may not even be useful, in developing a USF mechanism.

First, embedded costs involve the accretion of capital investments and their depreciation over a period of many years. Accounting records over this lengthy period of time are sometimes fragmentary, and they weren't necessarily recorded in the detail necessary to identify the specific costs incurred in specific wire centers, or along specific feeder routes or within specific distribution areas. Due to inadequate record keeping, it becomes difficult, or impossible, to track embedded costs to the level of geographic detail necessary for USF purposes. While wire centers are important structural features of the network from an engineering perspective, they have much less relevance from a financial or administrative perspective, where numerous functions are centralized. Thus a carrier with numerous wire centers is unlikely to maintain detailed records of the specific costs incurred in each part of its network. While it might be possible to gather or reconstruct some embedded cost data at the wire center level or below, this could be a very time consuming and difficult process, and any such effort will undoubtedly leave serious gaps or anomalies that reduce the value of the resulting data. For instance, fiber cable may have replaced copper cable along some feeder routes, but both investments may remain on the books.

Second, an embedded cost analysis will reflect the construction and maintenance of networks developed mainly during the period of traditional rate of return regulation. A classic weakness of ROR regulation is that it can be vulnerable to

goldplating or inefficiencies that translate into higher than necessary investment levels. Like any cost-plus system of compensation, ROR regulation can create perverse incentives, since the more you spend, the more you make, and inefficiencies are not necessarily penalized. Thus, one of the arguments against using embedded costs is that this data may include the impact of inefficiencies or goldplating which would have the effect of increasing the USF amount above the minimum necessary level. Admittedly, this problem can be ameliorated with adequate auditing and regulatory scrutiny. However, the Commission's experience with regulatory review of embedded costs is largely limited to statewide aggregates. Auditing the embedded costs incurred within particular wire centers or "high cost areas" will be much more difficult and time consuming than they type of auditing and scrutiny which typically occurs in an ordinary rate case.

With the use of embedded costs for universal service funding purposes, moreover, there is a third problem. Universal service support for high cost areas funds the difference between the carrier's estimated costs to serve those areas and a benchmark rate. Thus, the higher the estimated cost to serve, the higher the funded amount. This provides incentives for carriers to shift costs from their lower cost areas to their higher cost areas. This parallels a problem already familiar to regulators--the incentive for integrated carriers with both regulated and unregulated affiliates to load as many costs as possible onto the regulated parts of their firms, while minimizing the costs attributed to the unregulated operations. If the USF mechanism were built around embedded cost data, a carrier would have an incentive to record as much of its costs as possible within its rural, high cost areas, and to minimize the costs attributed to its low cost, urban areas. While it is easy to see how this could become a problem, it would be exceedingly difficult to accurately detect or fully solve this problem.

Fourth, the embedded approach has some inherent weaknesses which will become readily apparent if the market moves away from a single monopoly provider

towards a more competitive market with multiple carriers. In a multicarrier environment, it doesn't make much sense for a single carrier's embedded costs to drive the USF system. Why should carrier B be compensated from a USF based upon carrier A's costs? If the USF is based upon the incumbent carrier's costs, other carriers will tend to be overcompensated or under compensated, depending upon how their costs compare to the ILEC's costs. Furthermore, as competition develops, the funding system could become unstable, requiring constantly rising funding levels. As the ILEC's market share declines, its embedded costs will be spread over fewer lines, raising its per-line costs and increasing its per-line draw from the USF. If the competitive carriers also draw from the USF based upon the same per-line amount as the incumbent, their funding amount will increase even more rapidly, as they receive an ever-increasing amount per line multiplied times an increasing number of lines. Taken to the extreme, this could result in an extremely large USF amount. For instance, consider what would happen if the incumbent's market share in a particular high cost area were to decline to 5% of its initial number of lines, while its total embedded costs remain largely unchanged. As a result, its embedded cost per line would increase nearly twenty-fold while the total dollars the incumbent draws from the fund would remain largely unchanged. Meanwhile, the competitors would also receive nearly twenty times more per line, and thus the amount they draw from the fund would increase astronomically.

Q. USWC suggests that a way around this problem is to fund each carrier on the basis of its own costs. If embedded cost data were used, would this provide a workable solution?

A. No. All of the problems I have just described would apply to competitive carriers. There would be strong incentives for goldplating and misallocation of costs to high cost areas. Needless to say, it would be much more costly, and potentially impossible, to

deal with these problems through auditing and regulatory scrutiny when multiple carriers are involved. However, difficult it would be to solve these problems through auditing of an incumbent carrier, it would be far more difficult to solve the problem with numerous competitive carriers, particularly if these carriers are not regulated for any other purposes (e.g. rate setting).

Q. Since embedded cost analysis has these crippling defects, is there any value in having the rural local exchange carriers file embedded cost data?

A. Yes. While it may not be practical to establish a USF mechanism using embedded cost data, it can be useful to have the small rural LECs file embedded data–particularly if they can provide estimates for their individual wire centers or exchanges. With small carriers, it's not as difficult to identify the high-cost areas using embedded data, especially when each carrier only serves a handful of wire centers. Furthermore, those wire centers are typically small, and they are likely to all have above-average costs.

In fact, the embedded data for such carriers may prove useful in evaluating the forward-looking estimates produced by the proxy models. Experience shows that the accuracy of the national proxy models (i.e., the degree to which their estimates can be reconciled with embedded data) decreases as the size and density of the wire center declines. The most serious problems seem to arise in small wire centers and in rural areas. Embedded data from companies that only serve one or two wire centers can be very helpful in detecting problems and gaining a better understanding of the weaknesses in the proxy cost models.

Q. Then you believe the Commission will ultimately need to use forward-looking, long run cost estimates for all carriers, including rural independents?

A. Yes. The proxy modeling approach is the one that is most compatible with a competitive environment, and the requirements of the 1996 Telecommunications Act.

Congress sought not only to ensure that universal service will be funded, but also to ensure that this funding will be available to all providers, including facilities-based competitors. A forward-looking, long run costing approach is far more compatible with these requirements than an embedded costing approach for the reasons I just discussed. While the proxy models being evaluated in this proceeding may not be capable of accurately estimating costs for rural independents, I believe it will eventually become necessary to use a cost modeling approach for these LECs; embedded cost data will probably not suffice over the long term.

Q. Are there other advantages to the use of open, computer-based cost modeling?

A. Yes. A good model allows its users to test cause/effect hypotheses and to run alternative scenarios and sensitivity analyses. A computerized modeling approach can even be used to simulate the current network, so that the cost of the existing network can be compared with potential alternative network configurations in minute detail. The impact of new technologies can be tested using a model as well. For example, the models in this proceeding can be used to compare the costs of networks using relatively large amounts of fiber cable with networks using relatively little fiber capacity.

Q. Are there problems with the kind of forward-looking cost models being presented in this proceeding?

A. Yes. As the Commission discovered in the UNE and acknowledged in its 8th Supplemental Order, there are several problems with forward-looking models.

First, even a perfect forward looking model won't produce the same level of costs as those recorded on the carrier's books. Hence, USF payments based upon a modeling approach may result in substantial increases or decreases in the level of revenues received by the carrier (unless offsetting adjustments are made to access rates or other sources of revenues). Whether this is a problem or not will depend upon the

specific circumstances. The forward-looking costs, even if they are accurately estimated, are different from embedded costs. If the latter are higher than necessary, due to inefficiencies or as a result of goldplating, perhaps a reduction in the carriers revenues and profits is an acceptable outcome. On the other hand, if the carrier's network has been largely depreciated, or the forward looking cost is much higher than the original cost (e.g. due to the high cost of tunneling under sidewalks and replacing landscaping–problems that didn't arise when the embedded network was installed), is it equitable to let the carrier receive far more from the USF than they would have been entitled to receive under traditional ROR regulation? Changing abruptly from embedded costs to forward looking economic costs could potentially disadvantages ratepayers, or carriers, depending upon how the USF mechanism is implemented.

Q. Up to this point, you have been discussing essentially theoretical problems. Do the specific forward-looking models submitted in this proceeding have any weaknesses that should be of direct concern to this Commission?

A. Yes. As the Commission learned in the UNE proceedings, the BCPM and HAI models, while continually being improved, are far from perfect. I will defer my specific criticisms of these models until my later filing; suffice it to say here that despite some degree of convergence, these models show seriously disparate results, even when they use many of the same inputs. The model builders are notably reluctant to admit to any defects in their respective models, but they are often eager to identify problems with the alternatives. Hence, I anticipate that the Commission will be provided with considerable evidence concerning the weaknesses in each of these two models. For the moment, it is sufficient to note that the Commission should not simply be concerned with evaluating these competing criticisms and trying to figure out which model is better (or worse). Rather, it should be concerned with evaluating the overall level of accuracy which is currently being achieved by these models (how far off the mark are the results for

individual wire centers) and how best can the accuracy level be improved? The parties that have developed these models are primarily interested in the final outcome of the modeling process (how large or small the USF will be). Rather than concentrating their resources on improving the accuracy and capabilities of their models, the sponsors of both the BCPM and HAI models have expended vast sums on trying to persuade regulators to reject the other model, and to rely instead upon their own cost estimates. These parties have built-in incentives to gloss over demonstrated problems with their own models, and to present partial or ad hoc solutions as if they were total cures. Fortunately, the models themselves continue to improve, and there is every reason to believe that better, more accurate cost estimates can be developed if the Commission insists upon further improvements.