

Section 4: Alternative Cost Study Results

A. TELRIC Studies

Q. Would you please briefly explain the TELRIC cost estimates that you developed?

A. Yes. I developed cost results using copper cable in all locations except where total loop lengths exceed a specified engineering criteria or "breakpoint." I used the Company's criterion of 12,000 feet for my studies. Thus, in all distribution areas where the total loop length exceeds 12,000 feet, I had the model deploy fiber feeder instead of copper.

The data shown in the Cost Results: Summary reports are composite figures for each study, developed by totaling the annual cost in each wire center within the study, dividing the sum by twelve, and further dividing by the total number of access lines. I have run three TELRIC studies for each of the three rate groups (bands). The first study is based upon a network serving 100% of the existing market. The second is based upon a network serving just 25% of the existing market. The third is based upon a network serving 25% of the existing market in Zone 1, and none of the market in Zone 2. For each study, I have prepared a separate summary report, thereby facilitating comparisons between rate groups. In each case, the summary report separately states the cost of the network interface device (NID), the other major loop cost categories (customer termination equipment, distribution, and feeder) and three categories of switching costs: non-traffic-sensitive end-office (port), traffic-sensitive end-office (usage) and other/miscellaneous switching-related costs.

Consistent with provisions of the 1996 Telecommunications Act and the FCC, I would not necessarily recommend that the Commission unbundle and price each of these items separately at this time. It is probably sufficient to separately price and offer the NID, loop, port, and usage/other switching. However, it may eventually be appropriate to further unbundle and price network elements. For instance, drop wire/building cable costs can vary widely, depending upon the specific circumstances that apply at each customer location (e.g., distance

from the network interface device to the network terminal or other location where the drop is spliced to the distribution cable). Because these characteristics vary widely for different sizes and types of customers, it would not be unreasonable to unbundle drop wire/building cable, and to develop several different rates, which can vary appropriately with the relevant circumstances (e.g., length of the drop wire), rather than varying by rate group (band). Similarly, at some point it may be appropriate to unbundle feeder elements from distribution elements, allowing carriers the option of renting one portion of the loop plant without being forced to also rent the other portion. While I don't think it is necessary to follow this more disaggregated approach at this time, I think it is useful to separately state my cost estimates for these items, so the Commission may gain a deeper appreciation for the various components within the overall element estimates.

The table below summarizes my cost results using 100% market share and the 12,000 feet breakpoint engineering criteria.

	Rate Group 1	Rate Group 2	Rate Group 3
NID	\$.32	\$.33	\$.34
Loop	\$9.71	\$11.82	\$25.01
Switching			
Port	\$2.45	\$2.47	\$3.41
Usage	\$1.12	\$1.07	\$1.14
Other	\$.26	\$.26	\$.28

Q. Are these costs the total costs of providing unbundled elements for use by other carriers?

A. No. These cost estimates do not include any allowance for administrative, general support, and other common costs. Furthermore, providing these unbundled elements to carriers will entail some additional costs that will vary with the specific circumstances applicable to each carrier.

These additional items include the non-recurring costs of processing a carrier's order (which would vary depending upon the number of elements ordered at one time), the cost of making the physical connection between the element and the purchasing carrier's collocated equipment (which would vary depending upon the nature of the collocation arrangement), the cost of billing and collection (which would vary depending upon the total size of the carrier's bill, and the amount of billing detail they require), and perhaps some additional maintenance and testing (which might be required to meet a particular carrier's needs, beyond the level reflected in these estimates).

Q. It appears that there are some significant cost differences between the Company's three proposed rate groups. Is that true?

A. Yes, at least with regard to the loop category. As shown on the summary reports and in the table below, loop costs are smallest for rate group 1, and largest for rate group 3. However, the three groups are not entirely homogenous. One can gain a better feel for the situation by reviewing the Cost Results: Wire Center Summary reports contained on the CD portion of my Exhibit and which I describe in greater detail later. For example, as shown on page 6 of the Rate Group 3 report, loop costs range from \$13.67 to \$37.33 for the 4 Rate Group 3 wire centers included in my study. It should be noted that these are average costs for all loops within each wire center, and some heterogeneity exists within wire centers. Thus, for example, some areas within Rate Group 2 wire centers have loop costs that are as low as those in portions of the Rate Group 1 wire centers. Additionally, some heterogeneity exists within the proposed rate groups.

The overall pattern of bop costs is summarized in the following table, in which the wire centers have been sorted in ascending order of TELRIC loop costs:

Location	Rate Group 1	Rate Group 2	Rate Group 3
Overall	\$9.71	\$11.82	\$25.01
Westwood	8.27		
St. Bernard	8.79		
West Seventh 2	9.00		
Avondale	9.26		
Covedale	9.54		
Fairfield	9.72		
Hartwell	10.31		
Cheviot	10.53		
Westchester		10.53	
Sayler Park		11.49	
Groesbeck	11.51		
Tobasco		11.73	
Love land		12.08	
Hamilton		12.30	
Goshen		13.34	
Seven Mile			13.67
Miami		18.18	
Shandon			21.76
Reily			30.95
Bethel			37.33

This pattern of costs suggests that it would be reasonable to separately price the unbundled loop element for each of these three rate groups. However, the Company's assignment of wire centers to rate groups appears to be somewhat arbitrary. For example, as shown on CBT's response to Staff's Data Request No. 60, the Groesbeck wire center is on the dividing line between rate group 1 and rate group 2. If CBT had defined rate group 1 as all wire centers with 750 or more loops per square mile, rather than 647 or more loops per square mile, Groesbeck would have been classified as rate group 2. As shown on the table above, our cost results suggest that Groesbeck is more properly classified with the wire centers in rate group 2. A similar discrepancy between the Company's classification and the cost results occurs with regard to the Miami wire center, i.e., the cost results indicate that it would more properly be classified as rate group 3, rather than rate group 2.

Further more, significant discrepancies in cost can occur even within a single wire center. For example, page 4 of the Rate Group 3 Cost Results: Wire Center Summary report, contained in volume 2 of my exhibit, shows zone 1 and zone 2 distribution costs for each of the four Rate Group 3 wire centers included in my study. The zones represent groups of distribution areas, with the zone 2 areas being located farther from the wire center. As shown in these reports, distribution costs can vary significantly within a given wire center.

Even greater differences can occur with regard to the feeder costs required for zones 1 and 2. Since zone 2 is farther from the wire center, the length of the feeder cable required to serve zone 2 tends to be considerably longer (and thus more costly) than that required to serve zone 1. Furthermore, some sharing occurs between portions of the feeder that serve both zones 1 and 2, while other portions of the feeder only serve zone 2. Depending upon how this sharing is analyzed, it can further magnify the differences which tend to exist between the two zones. Taking into account differences in both distribution and feeder costs, it is readily apparent that in some instances it is significantly less costly to serve zone 1 of a wire center within proposed rate group 2 than it is to serve zone 2 of a wire center in proposed rate group 1. Yet, the

proposed rates follow the reverse pattern, since they only consider differences between rate groups, without any consideration of differences within the rate groups.

While it isn't necessary to reflect all of these complications in the pricing of unbundled loops, it should be recognized that if a uniform price is charged for loops throughout each wire center, competing carriers are not provided with accurate price signals. If unbundled loop prices are uniform, when carriers make the decision whether to rent a loop from CBT or to install their own loop facilities, they will tend to be given too strong an incentive to install their own facilities in the higher density areas near the wire center, and too strong an incentive to rent loops in the lower density areas located farther from the wire center.

Q. Would you please explain your estimates of the costs faced by a new entrant?

A. Yes. While I have primarily focused on the cost of network elements provided by the Company given the current size of the market and its current status as a quasi-monopoly carrier, I have also prepared some estimates based upon another scenario. While this proceeding is focused on the economic costs incurred by CBT, it is useful to consider the cost picture from the perspective of a new facilities-based entrant as well. Thus, some consideration should be given to the costs facing new carriers. Realistically, such carriers can only hope to serve a fraction of the market, since they will need to win customers from the incumbent. The three summary reports in volume 1 of my exhibit labeled 25% market share serve this purpose by illustrating the cost of a network that is large enough to serve 25% of the existing market. Clearly, a network serving 25% of the market does not benefit from economies of scale to the same degree as a network serving 100% of the market. The greatest discrepancy in cost occurs in the wire centers (and areas within wire centers) with relatively low densities.

The following table summarizes my cost estimates for a new entrant serving 25% of the entire market.

	Rate Group 1	Rate Group 2	Rate Group 3
NID	\$.32	\$.33	\$.34
Loop	\$16.55	\$23.25	\$72.12
Switching			
Port	\$3.02	\$3.08	\$4.84
Usage	\$1.18	\$1.12	\$1.23
Other	\$.27	\$.27	\$.37

The following table summarizes my cost estimates for a new entrant installing its own facilities to serve 25% of the market within zone 1, with no customers or facilities in zone 2:

	Rate Group 1	Rate Group 2	Rate Group 3
NID	\$.30	\$.33	\$.34
Loop	\$13.35	\$16.72	\$65.26
Switching			
Port	\$3.80	\$5.01	\$10.01
Usage	\$1.30	\$1.26	\$1.34
Other	\$.33	\$.39	\$.92

An understanding of the long-run costs facing a smaller carrier can be useful in this proceeding since the relative balance between the unbundled element rates and the cost to a new carrier of building its own facilities significantly affects the incentive to invest in new network facilities in Cincinnati Bell's service area. If the unbundled element prices are extremely

low relative to the costs facing a facilities based carrier, new entrants will have less incentive to build their own facilities, and will be more likely to rely upon the incumbent's unbundled network.

Of course, some carriers may choose to build their own facilities in some areas even if the costs of self provision are higher than the unbundled network rates, in order to gain increased control over their operations. A facilities-based carrier can better control its quality, the technical attributes of its network, and its costs, while a carrier relying upon the incumbent's unbundled facilities is somewhat at the mercy of the incumbent's operating decisions.

Q. The Cost Results: Summary reports do not show much detail. Can the Telecom Model produce other, more detailed reports?

A. Yes. Additional detail can be displayed using a variety of other standard reports, including: the Armis Account Expense Summary; Armis Account Investment Summary; Cost results: Wire Center Summary; Cost Results: Wire Center Detail; Network Characteristics: Wire Center Detail; and, Baseline Density: Wire Center Detail. Because of the level of detail which is shown in these reports, some of them tend to be rather lengthy. For example, if I had included one of these reports for each of the 21 cost studies I have prepared for this proceeding volume two of my exhibit would have increased in length to more than 9,000 pages. Hence, I have not provided hard copies of these all reports. Rather, I have provided a single example of most of these reports for one of the smallest studies: the Rate Group 3 TELRIC study for a network serving 100% of the market. However, all of these reports--including those which are not included in my exhibit--can be viewed on screen or printed using the CD copy of the Telecom Model which was provided as volume three of my exhibit.

Q. Could you now explain the two Armis summary reports?

A. These reports summarize the plant expenses and investments within a particular study, organized around the FCC system of accounts. In one report, total annual expenses and monthly expenses per line are reported for each account. In the other report, the plant investments within a particular study are summarized in accordance with the FCC system of accounts.

Q. You have also provided two additional Cost Results reports. Could you please explain these?

A. The Cost results: Wire Center Summary reports mentioned earlier summarize the cost results for each wire center included within a particular study. It is organized around major cost categories, and the results are summarized for each zone, where applicable, then summarized for the wire center as a whole.

The Cost Results: Wire Center Detail reports summarize the cost results in much greater detail than any of the other reports. Regardless of the scope of the study, this report follows the same basic format. It presents detailed cost results for each individual distribution area, summarized into zone 1 and zone 2 within each wire center, summarized again for each wire center as a whole, and finally summarized for all of the wire centers in the report.

Within each section of the report, the cost elements are disaggregated into a moderate level of detail, generally corresponding to major categories of plant and equipment. For example, distribution plant is disaggregated into: aerial structures, aerial copper cable; underground structures; underground copper cable; buried structures; and, buried copper cable. These figures represent aggregations of more detailed cost data (e.g. labor and materials) which are reflected in the cost model itself. As with the network characteristics report, the sequence of this report roughly follows the sequence of plant and equipment as you move from the customer to the central office.

In most sections, the first column of numbers shows the estimated investment within the specified categories (rows). As I mentioned, these amounts are outputs from the model which generally include both labor and material costs. The second column shows the annual carrying cost (depreciation, taxes and capital expense) associated with each plant account. This figure results from the multiplication of the appropriate annual carrying charge factor times the investment shown in the first column. The third column shows the estimated plant-specific expenses, which are usually a function of the investment as well. The fourth column shows the corresponding annual cost, which is the sum of the annual carrying cost and annual plant specific expense for the item in question. Two reports are generated for a LRSIC study: one for the network configuration including all customers/services *excluding* the customers or service in question, and a second report for the network configuration including all customers/services *including* the customers or service in question.

Q. Could you now explain the Network Characteristics: Wire Center detail report?

A. This report shows a variety of network characteristics; most of this information is summarized separately for the residential and business categories. The data is displayed for several different levels of geographic aggregation, i.e., for individual aspects of the network within each wire center, for zone 1 and zone 2 within each wire center, and for all the wire centers in the aggregate. The characteristics shown are: average bop length; number of lines; number of minutes; number of calls; percent aerial, underground and buried distribution; distribution fill factors; percent aerial, underground and buried feeder; and feeder fill factors. The sequence of the report generally follows the physical sequence of equipment from the customer to the wire center. For example, the NID and other customer termination facilities are shown first, then distribution cable, then feeder and finally switching and other facilities located at the wire center. Because this report can require ten or more pages per wire center per study, in my exhibit I have only included a single, relatively brief, example of this report in volume two of my exhibit.

Q. Finally, could you discuss the Baseline Density Characteristics report?

A. This report provides detailed information concerning the baseline density characteristics of the distribution areas included in a particular study. It is organized primarily on a geographic basis, listing the density of each distribution area, then the average density for each zone within a wire center, then the average density for each wire center. In this report, density is the total number of switched lines per square mile in the baseline data used in preparing the study, not adjusted to reflect the market share or other characteristics of the specific network being studied. A similar report can be prepared which shows the density characteristics after adjusting for market share and other study-specific factors (e.g. the presence or absence of particular classes of customers).