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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

February 17, 1998

Magalie Roman Salas, Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Re: Ex Parte Submission
Federal-State Joint Board on Universal Service; CC Docket No. 96-45
Forward-Looking Mechanism for High Cost Support for Non-Rural LECs; CC Docket No. 97-160

Dear Ms. Salas:

At the request of staff, we are providing further detail about some of the many concerns that have been expressed by our network engineers concerning the engineering of loops within the FCC staff's Hybrid Cost Proxy Model (HCPM) filed in the above captioned docket. These comments were initially prepared to address the HCPM as of January 1998. Review of the documentation for version 2.5 of the HCPM, which was put up on the FCC's web site on February 9, 1998, indicates that these concerns have not been addressed in version 2.5.[1]

First, the HCPM may place an excessive number of Serving Area Interface (SAI) terminals. The HCPM divides each wire center's serving area into grid cells, based on the average size of Census Blocks (CBs). If the population in a grid cell exceeds the user-specified maximum population that can be served by an SAI, the grid cell is then sub-divided

1 In addition, the documentation of this new version 2.5 of HCPM indicates that the HCPM developers have attempted to incorporate several superior features of the HAI Model, e.g., optimizing on the basis of total life cycle cost, rather than of first cost of a technology.

into quarters.[2] If any of the resulting four "subgrid" cells exceeds the population threshold, the quartering of this cell continues. But because the HCPM will quarter rather than halve grid cells if the population limit is exceeded, the HCPM will create grid cells that are unnecessarily small, and place an expensive SAI in each of the four subgrid cells In contrast, it is quite likely that halving the cell is all that would be required to ensure that each subgrid met the population maximum.

Second, HCPM appears to use a non-economic amount of copper T-1 feeder. HCPM selects between copper T-1 and fiber in the feeder based on engineering constraints on the length of copper cable and a rudimentary view about the relative costs of each type of plant, and chooses the option which has a lower cost. However, because the HCPM models the cost of T-1 as a simple linear function of the cost of analog copper, it fails to capture accurately the significantly more complex transmission engineering design that is required for T-1 digital transmission. These include complex considerations for repeater spacing and providing for two separate copper cable sheaths or for special screened cable to prevent "cross-talk" when more than 8 T-1s reside in the same cable sheath.[3] Because it does not include these costs, the HCPM will find an artificially lower cost of copper T-1 than is actually required, and select an excessive amount of this technology.

Third, HCPM does not collocate its SAI with the digital loop carrier (DLC) remote terminals. Rather, it extends copper subfeeder from a DLC site to an SAI site. This is contrary to generally accepted outside plant engineering principles, which collocates DLCs and SAIs to reduce the cost of provisioning circuits. If DLCs and SAIs are not collocated, a technician will have to visit both sites, first plugging in a line card at the DLC, and then traveling to the SAI to install a cross connection. The HCPM does not appear to make allowances for the extra labor and coordination costs that their noncollocated architecture will incur.

Fourth, the HCPM errs in a number of ways in its treatment of copper cable. It uses a maximum copper distance of 12 kilofeet if 26 gauge copper is used, requiring the use of 24 gauge cable to extend copper to 18 kilofeet. As AT&T and MCI have demonstrated in a previous ex parte, there is no engineering standard that limits 26 gauge copper to 12 kilofeet.[4] Furthermore, when the HCPM does use 24 gauge copper, it applies various multipliers to the cost of 26 gauge copper, to reflect the increased cost of the coarser wire and the more expensive electronics required. However, it is only the material cost of the actual cable that

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2 These cells are quartered rather than halved because of the HCPM's need to maintain geometric scalability of its cell dimensions.

3 Because the HAI model uses copper T-1 only in low density distribution applications, rather than in higher volume feeder applications as is done in the HCPM, it will not encounter situations requiring 8 T-1s in a single cable.

4 <u>See</u> Ex Parte letter from Richard N. Clarke of AT&T to Magalie Roman Salas, Secretary, FCC, in the above-captioned docket, dated January 6, 1998.

is higher; the cost of engineering and placing the plant does not vary with the thickness of the cable. Thus, even if the coarser gauge wire were required, these multipliers would overstate the cost because they are applied to costs that do not increase. In addition, the HCPM appears to expect that cable sizes will be optimally selected at each cable junction point. This would appear to require an excessive number of copper pair splices (up to one per block) and is unlikely to be economic. Placing unnecessary splices is expensive and degrades transmission characteristics. In addition, technicians installing cable do not carry an inventory of multiple cable sizes on their truck. It is much more efficient in terms of total costs to use complete reels of a single size of cable before switching to another size.

Finally, the HCPM uses a linear cost equation to determine many costs, e.g., the cost of copper cable placements or terminals. This is too simplistic, and does not capture the character of all of the significant drivers of cost, such as structure type. In addition, use of linear regressions to determine these cost equations may result in unreasonable prices. For example, the HCPM models the cost of terminals as a fixed amount per pair. Thus, under the HCPM's equation, the cost of a 25-pair buried terminal would be $568, an amount far in excess of any possible price, because the cost of such terminals does not rise linearly with the number of pairs.

For all these reasons, the costs of the network engineered in the HCPM are inaccurate - especially in the abnormal engineering situations that typically exist where the cost of universal service is an issue. While the HCPM is a laudable attempt to provide a simple model of the local exchange network, it would require a great deal of further refinement to accurately reflect correct engineering design criteria.

Respectfully submitted,

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