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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Washington, D.C.
July 25, 1996

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street N.W., Room 222
Washington, D.C. 20554

Re: CC DOCKET 96-98

Dear Mr. Caton:

The Commission Staff hereby submits for the record in this proceeding, CC DOCKET 96-98, a letter from Robert F. Roche, CTIA, to William F. Caton, Acting Secretary, Federal Communications Commission, dated December 8, 1995, including the attached paper, Gerald W. Brock, *Incremental Cost of Local Usage* (March 1995)(Brock Paper No. 3), which is in the record of CC DOCKET No. 94-54. The letter from Robert F. Roche and attached Brock Paper No. 3 are hereby incorporated into CC Docket 96-98.

Commission Staff

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FEDERAL COMMUNICATIONS COMMISSION
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Building The Wireless Future™

CTIA
Cellular Telecommunications Industry Association
1250 Connecticut Avenue, N.W.
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Washington, D.C. 20036
202-785-0081 Telephone
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December 8, 1995

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

RE: **Ex Parte Contact** - CC Docket No. 94-54

Dear Mr. Caton:

Attached are letters from Randall S. Coleman, Vice President Regulatory Policy and Law, which were sent to the following Commission personnel at 12.30 P.M. on December 8th, 1995.

Ms. Michele C. Farquhar
Mr. James Casserly
Ms. Lisa Smith
Mr. John Nakahata
Mr. James Coltharp
Mr. James Schlichting
Ms. Regina Keeney
Mr. Todd Silbergeld
Ms. Lauren Belvin
Mr. Richard Welch
Ms. Jackie Chorney

Pursuant to Section 1.1206 of the Commission's Rules, an original and one copy of these letter and their attachments are being filed with your office. If you have any questions concerning this submission, please contact the undersigned.

Sincerely,

Robert F. Roche

Attachments

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December 8, 1995

Building The
Wireless Future.

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Randall S. Coleman
Vice President for
Regulatory Policy and

BY HAND DELIVERY
Mr. James Casserly
Senior Legal Advisor
to Commissioner Susan Ness
Federal Communications Commission
1919 M Street, NW, Room 832
Washington, DC 20554-0001

Re: *Ex Parte* Presentation
CC Docket No. 94-54

Dear Jim:

I have attached information, all of which has already been placed in the record of the referenced proceeding, which addresses the issue of whether a "bill and keep" arrangement between local exchange carriers (LECs) and Commercial Mobile Radio Services (CMRS) providers could be construed to be a regulatory taking of local exchange carrier property. For your convenience, I have flagged the portions of the attached information that address that issue specifically.

Essentially, these materials show that:

- A "bill and keep" policy, which is equivalent to mutual compensation with a zero price for compensation, is economically efficient if either of two conditions are met: (1) traffic is approximately balanced in each direction, or (2) the actual costs are very low so that there is very little difference between a cost based rate and a zero rate. This second condition is met in the case of LEC-CMRS interconnection , given that the LEC incremental cost of terminating traffic of a competitor has been estimated to be approximately 0.2 cents/minute. *See* Gerald W. Brock, "Incremental Cost of Local Usage," March 16, 1995, at 2.

- In considering whether a "bill and keep" arrangement constitutes a taking for Fifth Amendment purposes, courts can be expected to look at three factors: (1) the economic impact of the regulation, (2) interference with investment-backed expectations, and (3) the character of the governmental action. The first factor generally requires that the property be rendered worthless. The second factor cannot be sustained by a mere

loss of anticipated profits. The third factor refers to a physical invasion of property. Thus, consideration of these three factors in the case of a "bill and keep' arrangement between LECs and CMRS providers does not lead to a conclusion that a taking would occur. *See* Cox Enterprises, Inc. Responses to LEC Argument Against "Bill and Keep," at 3.

- "Bill and keep is not a system of interconnection for free. Bill and keep is compensatory. There is a reciprocal exchange of traffic in which each company receives something of value." *Washington Utilities and Transportation Commission, et al V. U S WEST Communications, Inc.*, Docket Nos. UT-941464, UT-941465, UT-950146 and UT-950265, at 35.

- "[B]ill and keep is more consistent with the structure of cost occurrence than are the access charges that the incumbents [LECs] propose. The reason that local exchange services are flat rated is that most of the cost of local service is not sensitive with traffic volume but is related to access to the public switched network. The principal cost of terminating calls relates to the provision of the line to the subscriber's premise. The cost of this line is largely insensitive to the volume of and duration of calling. Even end-office switching costs have a large non-traffic sensitive component. It is simply wrong to suggest that the bill and keep procedure means that calls are being terminated 'for free.' The termination function is paid for, not by the originating company, but by the end-use customer in his flat monthly charge. This charge covers all access to and from the public switched network. Under bill and keep, a company is fully compensated for most call terminations by its own customer." *Id.* at 35-36.

- "That bill and keep is a fair compensation method is evident from the fact that it is the dominant current practice between adjacent LECs around the country . . . for terminating local (EAS) [Extended Area Service] traffic between adjacent exchanges. Where there is no gain to be achieved from anticompetitive or inefficient behavior, companies have elected bill and keep because of its inherent simplicity and efficiencies. As Dr. Zepp stated: 'This intercompany compensation method has been used . . . to establish intercompany compensation between local co-carriers who are neighbors. It is just as appropriate for local co-carriers who are competitors.'" *Id.* at 36.

It must be noted also that a bill and keep system between LECs and CMRS providers is in place today, however, in one direction only. CMRS providers pay to have their traffic terminated by LECs, but LECs do not compensate CMRS providers for their termination of LEC-orignated traffic. So far I am not aware of any parties claiming that today's arrangement is confiscatory.

INCREMENTAL COST OF LOCAL USAGE

Gerald W. Brock
March 16, 1995
Prepared for Cox Enterprises

SUMMARY

A reasonable estimate of the average incremental cost of local usage (and therefore the cost of terminating traffic received from a competitor) using digital technology is 0.2 cents per minute. That estimate is based on studies done by or supported by telephone companies. The cost is determined by peak period capacity and therefore the true cost is considerably higher than the 0.2 cents per minute average during the peak period and is zero during the non-peak period.

I. Introduction

In a separate paper prepared for Comcast, I have argued that the theoretically correct interconnection charge is cost based mutual compensation. However, cost can have many different meanings and in a regulatory context, cost based requirements can lead to interminable regulatory proceedings and disputes. Policy makers have consequently frequently sought structural methods of solving problems that do not require detailed oversight of cost rules.

One proposed structural rule is mutual compensation without oversight of actual rates, but as shown in the Comcast paper that approach is inadequate to limit the exercise of monopoly power. An alternative approach that dispenses with direct control of cost is the policy of "sender keep all" or "bill and keep" in which each party agrees to terminate traffic for the other without payment for terminating service. That is equivalent to mutual compensation with a zero price for compensation. It will be economically efficient if either of two conditions are met: (1) Traffic is approximately balanced in each direction; (2) The actual costs are very low so that there is little difference between a cost based rate and a zero rate.

Existing publicly available studies suggest that the incremental cost of local usage (and therefore the cost of terminating traffic from a competitor) is on average approximately 0.2 cents/minute. The actual cost is considerably higher during the peak period and zero during the off peak period. Thus it would not be efficient or desirable to charge at 0.2 cents/minute on a usage basis. However, the very low average number compared to the price currently charged by local exchange companies suggests that far greater distortions are likely from mutual compensation without control of rates than from sender keep all approaches.

There are two basic methods for estimating cost:

(1) engineering studies of the forward looking cost to supply a particular service;

(2) econometric (statistical) studies of the relationship between observed cost and observed outputs.

Both engineering and econometric studies provide useful information on cost. The engineering study allows one to focus on best practice technology and compute the incremental cost of adding capacity to provide a particular function. Econometric studies provide a reality check by using observed output and cost data rather than projections of expected cost. However, econometric studies may produce less precise estimates of the incremental cost of a particular service than engineering studies because they are measuring the correlation between variations in the total cost of different telephone companies and variations in the quantities of particular services provided by those companies. The cost data include costs for different embedded technologies used by the companies and are not precise enough to provide detailed estimates of the incremental costs of particular services with particular types of technology.

II. Engineering Estimate

The most comprehensive public engineering study of incremental cost was done by the Incremental Cost Task Force with members from GTE, Pacific Bell, the California Public

Utilities Commission, and the RAND Corporation.[1] The Task Force had access to data for telephone companies in California and performed a detailed engineering cost study for various output measures of local telephone service. Individual components were priced based on 1988 prices and costs were computed for switch investment, switch maintenance, interoffice transport, and call attempt costs. All costs were computed for calls during the busiest hour of the year because the investment and associated expenses are related entirely to capacity cost. The Task Force computed the following usage costs for each hundred call seconds (CCS) during the busiest hour of the year for "average" and "larger urban" exchanges:

switch investment	$ 5.00 - $ 10.00	per year
switch maintenance	.20 - .50	per year
interoffice calling	.50 - .60	per year
Total	$ 6.00 - $ 11.00	per year

In addition, the task force computed a cost of $ .30 to $.90 per year for each call attempt during the busiest hour of the year and estimated approximately 1.25 busy hour attempts per busy hour CCS.[2]

---

1 Bridger M. Mitchell, Incremental Costs of Telephone Access and Local Use, (Santa Monica, CA: The Rand Corporation, 1990); reprinted in William Pollard, ed., Marginal Cost Techniques for Telephone Services: Symposium Proceedings (Columbus, Ohio: National Regulatory Research Institute, 1991) (NRRI 91-6).

2 Ibid., p. 249, 250.

There are 8766 hours per year and the ratio of the peak usage rate to the average usage rate is approximately 3.[3] That implies that one busy hour CCS is approximately equal to 2922 CCS per year (8766/3). Because one CCS is equal to 1.67 minutes, costs per busy hour CCS can be converted into average costs per minute by dividing by 4880 (2922 total year CCS times 1.67 minutes/CCS). Thus the $6.00 - $11.00 cost per year per CCS during the busiest hour of the year translates into $.0012 - $.0023 per minute. The busy hour attempt cost adds $.375 - $ 1.125 per busy hour CCS (1.25 busy hour attempts per buy hour CCS and $.30 to $.90 annual cost per busy hour attempt), raising the total cost, including busy hour attempts, to $6.375 - $12.125, and the per minute cost to $.0013 - $.0025. Taking the middle of the estimated range gives a cost of $.0019 per minute, or approximately 0.2 cents/minute.

Because the cost is determined by the the peak capacity, the actual cost per minute is much higher at the peak and is zero at the off-peak. If, for example, one assumes that an equal size peak occurs for one hour in each business day (260 hours per year of peak usage and 8506 hours of non-peak usage), then the average cost per minute would be 2.1 cents for the 8.9 percent of the traffic that occurs during the 260 peak hours each year and the average

3 Nelia E. Park, Incremental Costs and Efficient Prices with Lumpy Capacity: The Two Product Case, (Santa Monica, CA: The Rand Corporation, 1994), p. 5.

cost per minute would be zero for the 91.1 percent of the traffic that occurs during the 8506 non-peak hours.

A variety of other engineering studies have been done for specific regulatory purposes and submitted to various state regulatory commissions. For example, New England Telephone prepared an engineering study for the Massachusetts PUC that found an incremental cost of 0.2 cents per minute for local usage served by electronic switches, the same as the Incremental Cost Task Force conclusion using California data.[4]

III. Econometric Estimate

Many econometric cost studies of telecommunication have been done, but the procedures used in most of them do not allow an estimate of the incremental cost of local service. One good econometric cost study that does provide an estimate of the marginal cost of local exchange service is the one performed in 1989 by Louis Perl and Jonathan Falk of NERA, using data from 39 companies (24 Bell and 15 non-Bell) over the years 1984-1987. They developed a statistical relationship between the total cost of the individual companies and the access lines, local usage, and toll usage provided by the companies.

Four different models were used for the statistical estimation. In two of the models, the data for each company

4 Reported in Lewis J. Perl and Jonathan Falk, "The Use of Econometric Analysis in Estimating Marginal Cost," in Pollard, Marginal Cost Techniques, op. cit.

was averaged over the four year period to eliminate the effects of minor year to year fluctuations and to provide a pure cross section estimate. In the other two models, observations were used for each company in each of the four years creating a mixture of time series and cross section observations. In two of the models, calls were used as the unit of usage measurement and in the other two calls minutes were used as the unit of usage measurement.

The estimated marginal costs for local minutes ranged from 0.2 cents per minute to 1.3 cents per minute. The costs per call developed in the models using number of calls as the usage unit were divided by the average holding time to produce estimates of cost per minute comparable to the those from the models using number of minutes as the usage unit. The lowest estimate came from the model with only cross section observations averaged over the four years. The highest estimate came from the model using all observations in a pooled cross section and time series and using calls as the unit of usage measurement. All four models had good statistical properties. Although there are various advantages and disadvantages of each of the four models, none of the four can be identified as either the clearly correct approach or an approach to be discarded.

The statistical form used by Perl and Falk generates marginal cost numbers approximately equal to average cost numbers. Thus it should be expected that their estimates will be somewhat higher than the engineering estimates of

marginal or incremental cost. Furthermore, the engineering estimates generated by the Incremental Cost Task Force were developed based on digital switching technology while the Perl and Falk estimate for local minutes served by electronic switches was based on the embedded technology in 1984-87 which was primarily analog. It is likely that the incremental costs of usage capacity for analog switching are higher than the incremental costs of usage capacity for digital switching.

IV. Conclusion

A reasonable estimate of the average incremental cost of terminating traffic using digital switches is 0.2 cents per minute. That estimate is supported by the engineering studies done with data for California and for Massachusetts and by one of the econometric models developed by Perl and Falk. Other reasonable econometric models using embedded cost data produce somewhat higher cost estimates. The cost is determined by peak period capacity and therefore the true cost is considerably higher than 0.2 cents/minute average during the peak period and is zero during the non-peak period.