

recommendations. In a similar vein, Pacific Telesis endorses creation of an “Advanced Service Working Group” to consider how to disperse advanced communications broadly throughout educational and medical institutions.⁵² The Telemedicine Advisory Committee could serve as a model for a similar “Education Telecommunications Advisory Council” or its duties could be expanded to include education issues. In any event, such a council with representatives from all affected parties could assist the Joint Board in making recommendations to the Commission with respect to the schools, libraries and health care provider support issues.

Along these lines, the comments of the Florida Cable Telecommunications Association (“FCTA”) are also instructive. In those comments, FCTA discusses its members’ experience in providing access to advanced communications services to schools and classrooms and its work with educators to provide free or reduced-cost communications services.⁵³ In this regard, FCTA discusses the plan adopted by the Florida legislature which includes a statewide “needs assessment” process conducted by the public and private sectors.

In its comments, Time Warner expresses a concern that, before answers can be obtained for the myriad of questions raised in the NPRM addressing schools, libraries and health care providers, “information must be gathered, through an NOI, from schools, libraries and health care providers.”⁵⁴ Time Warner concludes:

This information must describe, in detail, the telecommunications services currently being provided and utilized by these institutions. If services are not being provided or are inadequate, additional information will be needed to determine why the market has failed and how this failure can be remedied consistent with the 1996 Act’s overall goal to promote competition in the provision of communications services. Additional information will be needed on

⁵² Pacific Telesis at 12.

⁵³ Florida Cable Telecommunications Association at 13-18.

⁵⁴ Time Warner at 16.

the types of advanced services these institutions will require to ensure universal access to information.⁵⁵

Finally, as Teleport observes: “[w]hile the Act requires the Commission to address these issues now, it does not require the Commission to reach conclusions absent necessary information.”⁵⁶ Accordingly, Teleport urges the Commission to establish a “Phase II for the purpose of assessing needs and the costs of meeting the needs for these organizations.”⁵⁷

Given the numerous questions which must be resolved by the Joint Board by November, we believe it makes sense to create the type of advisory council discussed above to supervise a further information-gathering process and to develop recommendations for the Board. The council would conduct open proceedings to ensure that the affected parties, including schools, libraries, providers of services, and governmental entities, will be able to contribute to the council’s recommendations. The council would make recommendations to the Board on the functionalities and technologies which might be provided to schools and libraries (and health care providers if that issue is made part of the council’s mandate), and on other critical issues, such as the equipment and training necessary to make the best use of the services provided. Through an approach similar to the Florida “needs assessment” process, this council could help identify technology-neutral solutions and options to propose to the Joint Board which the Board can consider prior to making its recommendations to the Commission.

As Secretary Riley has said: “This is no time to think short term.”⁵⁸ But if we are to think “long term,” we must develop a dynamic process to enable all interested parties to present

⁵⁵ Id.

⁵⁶ Teleport at 18.

⁵⁷ Id.

⁵⁸ Secretary Richard W. Riley at 1.

all pertinent information and a reasoned analysis of that information to the Board, and through the Board, to the Commission. As the record currently stands, a case has not been made that the marketplace will not provide the many additional services sought by interested parties in this proceeding or that those services must be -- or should be -- provided pursuant to the universal service provisions of the 1996 Act.⁵⁹ An Education Advisory Council could serve as the focal point for developing the record necessary for the Joint Board and the Commission to take action in this area.⁶⁰

VIII. ADMINISTRATION OF SUPPORT MECHANISMS

In our comments, we urged that contributions to the universal service fund should be based on all revenues from telecommunication services, interstate and intrastate combined, as suggested in the NPRM. We observed that net, rather than gross, revenues from telecommunications services should be the basis for assessing contributions.⁶¹

⁵⁹ Continental Cablevision at 6-7.

⁶⁰ The 1996 Act does not require the Joint Board to recommend, nor the Commission to adopt, designation of additional services for support by a date certain.

⁶¹ NYNEX observes that the Commission “should not include revenues from transactions involving the content component for cable television services” in determining each provider’s share of the universal service payment, suggesting that revenues from the provision of the “transmission” element of cable service are to be included in calculating a provider’s USF contribution. NYNEX at 24, n. 39 (emphasis added). See also USTA at 24. But USF contributions can only be assessed against carriers providing “telecommunications.” And, as the structure and definitions of the Communications Act, both prior to and after enactment of the 1996 Act, make clear, “cable service” (including both transmission and content components) is separate and distinct from common carrier telecommunications service. 47 U.S.C. § 153(44) (a “telecommunications carrier” shall be treated as a common carrier to the extent it is engaged in providing telecommunications services). Cable systems are insulated from common carrier regulation by reason of providing cable service. Compare the definition of “telecommunications carrier” in Section 3 (a)(2) of 1996 Act with 47 U.S.C. §541 (c) (insulating cable service from common carrier regulation). Significantly, the 1996 Act retained and expanded the definition of “cable service” from Title VI, even as it added new definitions for “telecommunications service” and “telecommunications.”

ATTACHMENT A

THE BCM DEBATE

A Further Discussion

Susan M. Baldwin
Lee L. Selwyn
Helen E. Golding

May 1996

 **ECONOMICS AND TECHNOLOGY, INC.**

ONE WASHINGTON MALL • BOSTON, MASSACHUSETTS 02108

Copyright © 1996 Economics and Technology, Inc.
All rights reserved.

This document may not be reproduced, in whole or in part, by photocopying, electronic, or other means, without the express written consent of Economics and Technology, Inc., One Washington Mall, Boston, Massachusetts 02108 USA. Permission to copy is hereby granted for purposes related to Federal Communications Commission CC Docket No. 96-45.

Preface | THE BCM DEBATE

In *The Cost of Universal Service: A Critical Assessment of the Benchmark Cost Model*, Economics and Technology, Inc. analyzed the Benchmark Cost Model (BCM) as a tool for determining the magnitude of universal service support. Through this analysis, ETI determined that the BCM had many of the essential attributes of a reliable and useful cost proxy model, but that several key input assumptions in the model, as presently specified, had the cumulative effect of substantially exaggerating the aggregate cost of basic local service and of the universal service funding requirement. ETI recommended a series of corrections to the BCM, and concluded that, with these corrections, the BCM should be adopted by federal and state policy makers as a valuable tool for developing any universal service funding that might be required to fulfill the mandates of the *Telecommunications Act of 1996*.

Many of the parties that submitted comments in CC Docket No. 96-45 took a position on the overall merit of cost proxies in general and/or the BCM in particular. Of those parties, several offered detailed criticisms of the BCM or competing approaches that indirectly challenge the use of the BCM. At the request of the National Cable Television Association (NCTA), ETI has analyzed the criticisms of the BCM by Southwestern Bell Telephone Company and BellSouth (attachment prepared by NERA), the Pacific Bell comments regarding its competing Cost Proxy Model, the BCM enhancements discussed by US West (a BCM Joint Sponsor), and the USTA proposal. Where comments of other parties echoed (or responded to) the principal criticisms made by the above-referenced parties, ETI has also reflected those comments in its analysis.

The project was conducted under the overall direction of Susan M. Baldwin, Dr. Lee L. Selwyn, and Helen E. Golding. Contributing to this work were John T. McDermott, Michael J. DeWinter, Irena V. Tunkel, and Scott C. Lundquist. The views in this report are those of ETI and do not necessarily reflect the views of the NCTA.

May 1996

Economics and Technology, Inc.
Boston, Massachusetts 02108 USA

Executive Summary | THE BCM DEBATE

The strongest critics of the BCM are the parties who refuse to accept a proxy model in any form, and steadfastly maintain that only “actual” embedded costs can form the basis for universal service support. For some others, the principal flaw arises from the fact that the BCM does not attempt to model carrier-specific incremental costs. In its response, ETI concludes that the advantages of having an objective measure of efficient, forward-looking costs far outweigh the purported benefits from the use of “actual” embedded costs, and that the proxy approach is more compatible with the overarching pro-competitive policies of the *Telecommunications Act of 1996*. ETI also responds to claims regarding carrier-specific costs and models, including Pacific Bell’s CPM. For each and every carrier-specific cost analysis (whether in the form of a model or cost study), specific and detailed scrutiny is required to determine the reasonableness of assumptions and accuracy of the underlying data. Since much of this data is within the exclusive control of each LEC (and may, in addition, be treated as proprietary), analyzing and correcting carrier-specific models for each LEC would create an enormous burden on the FCC, state PUCs, and all other interested parties (as evidenced by the extensive, ongoing proceedings in California).

Contrary to assertions of the incumbent LECs, the level of high cost support that the BCM computes is not a *subset* of some larger, ill-defined universal service support that is necessary for LECs to compete efficiently in the local market. Other than income-targeted support and the TRS, high cost support is the only component of universal service support that potentially relates to the continued affordability of basic residential telephone service in a competitive local market. Furthermore, the BCM flaws that parties legitimately identified have been largely or entirely addressed in ETI’s previous examination of the model. The corrections that ETI identified in *The Cost of Universal Service, A Critical Assessment of the Benchmark Cost Model* continue to be critical changes to the BCM that should be adopted before the BCM is used as a policy making and universal service funding tool.

Finally, the comments that were recently filed in CC Docket No. 96-45 illustrate the importance of resolving the ongoing controversy over the use of a cost proxy model in assessing the need for and size of universal service support. With three of the RBHCs favoring cost proxy models (NYNEX, Pacific Telesis, and US West) and two of the RBHCs favoring embedded costs (BellSouth and Southwestern Bell), consensus on this matter is

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

improbable.¹ Even less likely is comprehensive industry agreement on all of the attributes of any given cost proxy model. The “default” resolution of this matter would result in a continued reliance on embedded costs. It is thus critical that the Commission establish a date certain for adopting a proxy model which, while perhaps not perfect, will be a reliable engineering and economic model that reflects most of the significant factors that affect the cost of providing basic local exchange service.

1. Ameritech states there “continues to be a legitimate issue within the industry regarding the use of proxy models, as opposed to reported costs, for administering universal service support.” However, Ameritech also states that “no definitive assessment can be made at this time” and thus it recommends the use of actual wire center costs. Ameritech Comments at 12. Bell Atlantic’s use of the word “costs” appears to refer to embedded costs but the comments are not explicit in this regard.

Table of Contents

THE BCM DEBATE

PREFACE	i
EXECUTIVE SUMMARY	iii
1 EMBEDDED VS. FORWARD-LOOKING COSTS AS THE FOUNDATION FOR UNIVERSAL SERVICE FUNDING REQUIREMENTS	1
1.1 Universal service costs are not, by definition, equivalent to the reported, embedded costs of service for incumbent local exchange carriers	1
1.2 “Comparability” is not a reliable measure of the BCM’s validity	5
1.3 There are many plausible reasons why the BCM and high-cost fund results (as contrasted by Southwestern Bell) should not match, but the differences are not attributable to weaknesses in the BCM	6
1.4 The fact that high cost support to Tier 1 LECs increases disproportionately under the BCM is a direct consequence of the geographic unit chosen for determining universal service support	9
1.5 The objective of a cost proxy model is to portray an accurate representation of universal service costs without capturing an exact likeness of actual LEC investments	12
2 CAPTURING A REALISTIC PORTRAYAL OF THE COSTS OF UNIVERSAL SERVICE	13
2.1 There is no basis to conclude that the BCM produces a lower bound for universal service support requirements	13

The BCM Debate

2.2	A cost proxy model for universal service should reflect deployment decisions that are economically rational for the provision of basic local telephone service and which may not always reflect strategic decisions that relate to a LEC's total network engineering requirements	14
	The Joint Sponsors should not be permitted to limit parties' examination and testing of critical attributes in the BCM, or to intimidate those parties who may seek to address aspects of the BCM that some of the Sponsors have tried to place "off limits"	15
2.3	The need for and size of high cost support should be examined at the wire center level	18
	Appendix 2: Correspondence from US West and ETI response	23
3	RESOLVING THE COST PROXY DEBATE	33
3.1	Pacific Bell's Cost Proxy Model	33
3.2	Universal service funding should only encompass targeted subsidies where there is a well-documented need	35
3.3	A consensus on each and every aspect of a cost proxy model is unlikely to emerge and therefore the Commission should establish a reasonable target date to finalize the BCM	36
TABLES		
Table 1.1	States with BCM Average Costs Above ARMIS Costs Are Low Density States	7
Table 1.2	Per-Company Support Decreases as Level of Aggregation Increases	10
Table 1.3	Percentage of Overall Universal Service Funding by Company	11
Table 2.1	The Level of Aggregation Significantly Influences the Universal Service Funding Requirement (Washington State without ETI partial Corrections)	19

The BCM Debate

Table 2.2	The Level of Aggregation Significantly Influences the Universal Service Funding Requirement (Washington State with ETI partial Corrections)	20
Table 2.3	Comparative Summary Results of the ETI Partially Corrected BCM at the CBG Level and Wire Center Level	21

1 | EMBEDDED VS. FORWARD-LOOKING COSTS AS THE FOUNDATION FOR UNIVERSAL SERVICE FUNDING REQUIREMENTS

1.1 Universal service costs are not, by definition, equivalent to the reported, embedded costs of service for incumbent local exchange carriers

Of parties that attempt to discredit the Benchmark Cost Model (BCM), one of the most vehement criticisms is that it is not based on LECs' (that is to say, incumbent LECs') "actual" costs. To parties who espouse this approach, such as Southwestern Bell Telephone (SWBT) and USTA, for costs to be "actual" they must be (1) embedded (historical), not forward-looking (2) reported, rather than modeled, and (3) carrier-specific, rather than typical of the industry as a whole.

This view of universal service support advances the interests of incumbent LECs far more than it protects the interests of the customers of basic local exchange service. The objective of the *Telecommunications Act of 1996* is to make universal service sufficient, not expansive, and to structure universal service support in a manner that is compatible with a market that offers consumers a choice of local exchange carriers.¹ Instead of achieving these objectives, the use of "actual" costs threatens to cause the support requirement to balloon and to burden the emerging local exchange service market with extensive historical cost baggage that will slow down competition.

One critic, SWBT, goes so far as to suggest that for support to be "specific" and "sufficient" under Section 245(b)(5) of the *Telecommunications Act*, it must be based on a service provider's historical costs of providing universal service and represent the difference between those costs and the "actual" revenues collected for such service.² Neither the express terms of the *Telecommunications Act* nor its overall policy framework supports this assertion, and SWBT's comments do not provide any supporting rationale for this claim. The use of embedded, fully distributed costs is actually at odds with guidance elsewhere in

1. *Telecommunications Act of 1996*, Pub. L. No. 104-104, 110 Stat.56 (1996) ("*Telecommunications Act*").

2. SWBT Comments at 13.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

the *Telecommunications Act* regarding the relevant costs in a competitive environment. The *Telecommunications Act* generally avoids and/or expresses disapproval of costing based on historical, rate-of-return-based regulation, i.e., embedded cost, in favor of incremental cost.³ The BCM certainly produces “specific” costs, down to the CBG level, and it is better suited to produce predictable and consistent results than the independently specified and often unverifiable cost numbers produced by each and every incumbent LEC. Whether or not the amount of support is “sufficient” is a more difficult (and subjective) determination. However, to be consistent with the objectives of the *Telecommunications Act*, a “sufficient” amount of support should be read conservatively to mean “only enough” to do the job of ensuring universal service, and not as an amount that indemnifies incumbent providers for their historical investments.

As to the claim that the only costs that merit consideration are reported costs rather than modeled, the incumbent LEC bias again comes through. Data that SWBT, USTA, and others so matter of factly characterize as “actual” are data that independent parties have virtually no way to verify. The fact that the numbers are written down and reported to the FCC does not ensure their accuracy or reliability. Moreover, the fact that there are rules about which costs should be reported does not guarantee consistency in how each LEC construes those rules. Under the USTA plan, which would eliminate high-cost funding for larger LECs but at the same time remove the cap on this fund, there is a tremendous opportunity for incumbent rural LECs⁴ to expand their claims for support.

Although many incumbent LECs oppose the BCM, several state public utility commissions “think this model has considerable promise and should continue to be developed by the Commission.”⁵ While the eight states jointly filing comments propose some specific modifications of the BCM and indicate that they do not believe it is ready to be used at the present time, they clearly recognize its advantages over a support system that is “influenced by the behavior or policies of particular carriers.”⁶ Also, the National Association of State Utility Consumer Advocates supports the use of a “verifiable proxy cost model” and also concludes that the BCM is “superior to the proxy model proposed by

3. See, e.g., *Telecommunications Act*, Secs. 252(d)(1)(A) and 252(d)(2)(B).

4. Under the USTA proposal, competitive local exchange carriers would not have access to the existing high cost support. USTA Comments at 17, footnote 22.

5. Joint Comments of the Maine Public Utilities Commission, Montana Public Service Commission, Nebraska Public Service Commission, New Hampshire Public Utilities Commission, New Mexico State Corporation Commission, Utah Public Service Commission, Vermont Department of Public Service and Public Service Board, and Public Service Commission of West Virginia (hereinafter, “Eight States Comments”), at 7.

6. *Id.* at 5.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

Telesis.”⁷ Even within the incumbent LEC community, there is a realization that embedded costs have serious problems. Two of the Tier 1 LECs are Joint Sponsors of the BCM (NYNEX and US West), and a third Tier 1 LEC (Pacific Bell) favors the use of a proxy cost model rather than “actual” costs because it “removes the incentive for inefficient operations that comes along with allowing recovery for any level of investment or engineering practice.”⁸

Basing the distribution of universal service support on a company’s reported costs would be entirely inconsistent with the competition goals and the elimination of rate of return regulation as set forth in the *Telecommunications Act*.⁹ The reported costs necessarily reflect a carrier’s *actual* network design that reflects engineering goals associated with services other than basic residential local service and which do not necessarily represent the most efficient way to deliver single-line basic service to households. Embedded costs likely reflect low fill factors associated with LECs’ strategic interest in constructing excess capacity.

The incumbent LECs’ existing networks — upon which embedded ARMIS costs are based — include substantial excess capacity and reflect engineering decisions that in no way relate to the provision of basic local telephone service to households. Incumbent LECs would have policy makers believe that ARMIS costs are more “real” and thus more reliable than the results of a theoretical cost proxy model. ARMIS may capture costs that have “really” been incurred, but the fact that these costs have been incurred does not mean that all of them were necessary for the provision of single-line basic residential telephone service. The fact that LECs “actually” spent ratepayer dollars to build a network may be an accurate statement, but there is simply no basis for assuming that all aspects of those expenditures and network design had to do with the efficient deployment of basic telephone service. Indeed, there are many reasons to believe that the reported “actual” costs reflect decisions to deploy excess capacity for Centrex, for additional lines to households, and for other services with variable demand that have absolutely nothing to do with basic telephone service. Reported “actual” costs reflect average utilization factors for outside plant that are exceptionally low and deployment of fiber in the feeder that was motivated by strategic rather than economic reasons, reasons that do not relate to offering basic local exchange service in the least-cost fashion.¹⁰

7. NASUCA Comments at 19-21.

8. Pacific Bell Comments at 18.

9. *Telecommunications Act*, Secs. 252(d)(1)(A) and 252(d)(2)(B).

10. See California PUC R.95-01-020/I.95-01-021, *Universal Service Proceeding*, Direct Testimony of Lee L. Selwyn, April 17, 1996; Rebuttal Testimony of Lee L. Selwyn, April 24, 1996.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

USTA proposes to determine the need for universal service support by evaluating, among other things, Part 36 and Part 69 embedded costs.¹¹ In order to compute a total interstate high cost fund,¹² USTA used the BCM to disaggregate study area interstate “base factor portion” (BFP) costs to a wire center level.¹³ USTA then compared these disaggregated embedded costs to an affordability benchmark. Setting aside the dubious merits of the other aspects of the proposal, the basis of USTA’s determination of the relevant cost, i.e., embedded costs, is entirely inappropriate. Embedded costs reflect past inefficiencies, including overbuilt plant, and may also reflect management decisions that were motivated by competitive strategies for which neither ratepayers nor prospective competitors should bear responsibility. Second, because ARMIS costs are the LECs’ *reported* costs, reliance on them would not create any incentive for LECs to maximize their network and operational efficiency.

Using these ARMIS-based *interstate* costs of approximately \$10.8-billion for the entire country,¹⁴ and comparing them to certain sources of support (increased end user common line revenues, decreased carrier common line revenues, decreased long term support, the existing high cost support, and the existing DEM weighting support), USTA computes an *entirely new and additional* need for approximately \$3.6-billion in a high cost fund. SWBT fails, however, to provide information as to the *existing* source of this alleged level of required universal service support. The \$3.6-billion would be *in addition to* the continuation of the existing high cost fund of \$735-million and DEM weighting support of \$311-million.¹⁵

Embedded costs reflect not only past LEC investment decisions and operating inefficiencies, but also they are rooted in rate of return regulation, a regulatory paradigm that LECs have sought to discredit, that the FCC and many state commissions have since replaced with price caps or other forms of “incentive” regulation, and that the *Telecommunications Act* has legislated out of existence all together. Most of the price cap

11. USTA Comments at 17-18.

12. USTA Comments, Attachment 3, at 7.

13. The so-called BFP costs are those that are presently assigned to the common line category and that are recovered through EUCL and CCL charges. USTA, Attachment 3, at 1.

14. By way of comparison, the BCM yields an *unseparated* (i.e., total) cost of either \$18.4-billion (assuming the forward-looking cost factor) or \$25.4-billion (using the embedded cost factor). Baldwin, Susan M. and Lee L. Selwyn, *The Cost of Universal Service, A Critical Assessment of the Benchmark Cost Model*, April 1996 (“*The Cost of Universal Service*”) at 27. Applying a 25% separations factor to these figures would yield an *interstate* amount of \$4.6-billion or \$6.4-billion, approximately one-half that used by USTA.

15. At the end of a four-year transition, the USTA proposal would eliminate the existing high cost fund and DEM weighting support for non-rural telephone companies.

LECs have elected the “no sharing” option under the FCC price cap system, yet here ask to be made whole when threatened with any earnings erosion. The FCC should soundly reject this “heads I win, tails I win” attitude. If, however, the Commission determines that universal service support is to be based upon embedded costs as USTA and some LECs urge, which it should not, the Commission should first subject LECs to a full-blown RORR-type general rate case proceeding, including findings as to which rate base assets are used and useful for the ongoing provision of universal service, and which should be disallowed for this purpose.

1.2 “Comparability” is not a reliable measure of the BCM’s validity

Another attempt to shift the debate over the BCM’s validity is SWBT’s attempt to make comparability to actual costs the touchstone for establishing credibility, saying, “before any model can be adopted, the validity of that model must be established by testing its hypothesis against known and measurable results. The only appropriate test is the comparison to actual network costs of study areas across the nation.”¹⁶ As ETI’s original report emphasized,¹⁷ it is imperative that the Commission resist the temptation to judge the reliability of a cost proxy model by whether its results can precisely match the cost results reported by the LECs through ARMIS or other embedded cost studies. Such a comparison is fundamentally flawed by the fact that what is being modeled *is intended to represent different costs* from what is reported. Moreover, there is no basis for attributing any resulting “mismatch” to errors in the cost proxy model, rather than in the reported costs. The appropriate remedy for concerns about the reliability of the model is to engage in a rigorous and public debate over the model’s core assumptions and inputs, such as ETI performed in its analysis of the BCM, rather than to attack the BCM collaterally, as SWBT and certain other LECs have done.

16. SWBT Comments at 14.

17. *The Cost of Universal Service* at 9-16.

1.3 There are many plausible reasons why the BCM and high-cost fund results (as contrasted by Southwestern Bell) should not match, but the differences are not attributable to weaknesses in the BCM

The analysis in SWBT's Attachment 5 details wide variance between data for the existing FCC high cost fund¹⁸ and the BCM results in several areas. SWBT insinuates that BCM produces inconsistent, unpredictable results — in particular, that BCM costs are significantly lower than results based on ARMIS data for some states and significantly higher for others. As a fundamental matter, because the BCM was never intended to match the high cost fund data or to “model” incumbent LECs' embedded costs, a comparison of modelled costs to “actual” embedded costs is not a meaningful test of reliability and accuracy for a cost proxy model.

Regarding SWBT's argument that the BCM is unreliable because it seems to have a poor correlation with existing high cost fund results (in Attachment 5, SWBT portrays a comparison of BCM results to “actual” costs as varying by as much as 50% higher to 69% lower), a closer examination reveals that BCM results are not random, and in fact show a statistically significant relationship to actual cost data. Furthermore, as is shown in Table 1.1 below, the seven states¹⁹ for which SWBT's analysis showed that the BCM produced a higher loop investment than the ARMIS-based loop investment are among the lowest density population states in the United States.²⁰

18. The existing FCC high cost fund is frequently referred to as the universal service fund. For sake of clarity, we use the term “high cost fund.” For a summary of existing funding, by state, under the high cost fund, see page 137 of *The Cost of Universal Service*.

19. These seven states are Idaho, Iowa, Montana, Nebraska, Nevada, North Dakota, and South Dakota. SWBT Comments, Attachment 5, at 6-7.

20. We ran a regression analysis on the data in Attachment 5, at 11-12 for two data sets, one *with* all states and one excluding the seven states identified in Table 1.1. The R^2 for the former analysis, is 0.29 and the R^2 *without* these seven states is 0.52.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

Table 1.1				
States with BCM Average Costs Above ARMIS Costs Are Low Density States Total Investment				
State	ARMIS Cost per Line	BCM Cost per Line	Percent Difference	U.S. State Density Rank
Idaho	\$1,088	\$1,184	9%	44th
Iowa	\$679	\$778	15%	33rd
Montana	\$1,160	\$1,625	40%	48th
Nebraska	\$781	\$953	22%	42nd
Nevada	\$653	\$802	23%	45th
North Dakota	\$1,130	\$1,382	22%	46th
South Dakota	\$1,093	\$1,435	33%	47th

Note: SWBT Attachment excludes switch costs from BCM results. The data shown are investment data, i.e., they do not reflect any expense factor.
Source: SWBT Comments, Attachment 5, pages 6-7; Bureau of the Census, 1990, "Density of Population by State," (per square mile, land area only).

ETI concluded in the original report that several corrections needed to be made to BCM input data and algorithms to make rural costs more accurate.²¹ Assuming that a comparison of cost proxy results with LECs' reported results was a valid undertaking — an assumption that is not readily convincing — such a comparison should not be made until such time as the BCM is fully corrected.²² Accordingly, the FCC should reject in its entirety Attachment 5 to SWBT's comments because the attachment includes an irrelevant comparison and is based upon faulty BCM results.

21. See e.g., *The Cost of Universal Service*, at 139-140.

22. If the BCM were run with ETI's partial corrections, it is unlikely that any of the state's costs as computed by the BCM would be higher than the ARMIS costs. For example, we ran the BCM for the State of Montana reflecting the partial corrections that are identified on page 158 of *The Cost of Universal Service* and, consistent with SWBT's comparison, excluded switch costs. The result of this computation was a total investment of \$1098 per line, approximately 5% less than the embedded costs. The implementation of ETI's other corrections would further increase this gap between ARMIS and BCM results.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

There is no reason to expect there to be a constant differential between reported costs and modelled costs; one company may be more efficient than another. As observed by Sprint,

The BCM treats all companies, and all areas, equally and fairly because they [sic] ignore the varying degrees of economic efficiency and biases present at individual companies.²³

Similarly, the comments of regulatory bodies in eight states indicate that if “the input factors for calculating financial assistance can be made behaviorally independent — perhaps by utilizing such factors as topography or population distribution — the Commission can be assured that its programs will be responding to legitimate cost differences from one area to another. In that sense, the ideal distribution formula would utilize objective input data for calculating assistance to rural and high cost areas, and not man-made or controllable factors.”²⁴

Generally, the results of a cost proxy model — which is based upon objective factors — should determine whether high cost support is appropriate, and if so, the level of support warranted to ensure affordable service throughout the area. However, should a LEC believe that there are unique, extenuating natural circumstances (i.e., circumstances beyond the control of the LEC and beyond the modelling capacity of the BCM) that warrant consideration by the Commission in its calculation of a cost proxy, it may be reasonable to provide an exception procedure to allow a LEC to petition the Commission for special consideration. To minimize administrative burden, the Commission would need to carefully identify and limit the appropriate parameters for such petitions (e.g., the slope of the land must be greater than a specified number of standard deviations from the norm; the average annual rainfall must be greater than a specified number of standard deviations from the norm; etc.). Satisfying these parameters would not guarantee an exemption but would simply qualify the LEC for special consideration.

23. Sprint Comments at 11.

24. Eight States Comments at 5.

1.4 The fact that high cost support to Tier 1 LECs increases disproportionately under the BCM is a direct consequence of the geographic unit chosen for determining universal service support

One of the criticisms of the BCM is that it would disproportionately increase high cost support for to Tier 1 LECs. SWBT calculated that currently Tier 1 LECs receive 9.1% of all high cost support and asserts that under the BCM (under various scenarios reflecting a range of price support and the two different cost factors), the Tier 1 LECs would receive between 37% and 41% of high cost support.²⁵ The reason that a strict application of the BCM would yield this result is a direct consequence of the level of aggregation that is used for determining whether and how much high cost support is used. Under the present high cost system, a company's entire study area is used, which, in the case of Tier 1 LECs is exponentially larger than a CBG. When costs are averaged over larger areas, then there will be fewer (and possibly) no instances where a Tier 1 LEC's *average* cost is above a desired price threshold.

Running the BCM, but aggregating to the study area instead of the CBG level illustrates this point. Table 1.2 below shows, for the state of Washington, that if the BCM-computed costs (with or without ETI's partial corrections) are examined on a *study area* basis, the Tier 1 LECs (US West, GTE, and Contel) would not receive any high-cost support.²⁶ This phenomenon is not the least surprising and is not in any way indicative of a methodological flaw *per se* in the BCM, but rather underscores the importance of the policy maker's decision as to the size of the geographic unit that should be used for assessing a company's high cost need.

25. SWBT Comments, Attachment 5 at 3, 14.

26. This analysis reflects the use of the forward looking cost factor.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

Table 1.2			
Per-Company Support Decreases As Level of Aggregation Increases (BCM using ETI Partial Corrections) Washington State			
	CBG Level	Wire Center Level	Study Area Level
US West	\$4,825,845	\$2,325,519	\$0
GTE	\$2,096,140	\$842,438	\$0
Contel	\$1,397,186	\$1,080,162	\$0
Other (small LECs)	\$7,449,296	\$5,417,159	\$453,092
Total	\$15,768,467	\$9,665,278	\$453,092
<p>Note: Analysis reflects forward-looking cost factor; a supported price of \$30; and the ETI partial corrections identified on page 158 of <i>The Cost of Universal Service</i>. Source: BCM Analysis for the State of Washington</p>			

Table 1.3 demonstrates that the consequence of implementing ETI's partial corrections and assessing need on a wire center level is to decrease slightly the Tier 1 LECs' share of high cost support.²⁷ Under the BCM default, Tier 1 LECs would receive approximately 60% of the high cost support and under the partially corrected, wire center based approach, Tier 1 LECs would receive 44% of the high cost support.

27. As was stated in the original ETI report, under this scenario costs would continue to be examined and computed at the CBG level, but would then the individual CBG cost results would be averaged at the wire center level before any determination was made as to the need for or size of high cost support.

Embedded vs. Forward-Looking Costs as the Foundation for USF Requirements

Table 1.3			
Percentage of Overall Universal Service Funding by Company Washington State			
	BCM Default	ETI Partial Corrections (CBGs)	ETI Partial Corrections (Wire Centers)
US West	33%	31%	24%
GTE	17%	13%	9%
Contel	9%	9%	11%
Others (Small LECs)	41%	47%	56%
Note: These percentages are calculated using the \$30 support threshold. ²⁸ Source: BCM Analysis for the State of Washington.			

If ETI's other recommended corrections were implemented, the distribution of high cost funds among LECs might change further. Even after necessary corrections are made to the BCM (including an examination of costs at the wire center level), the BCM may well still yield more high cost support for Tier 1 LECs than they now receive. The appropriateness of Tier 1 LECs receiving high cost support (and/or more high cost support than they now receive) is a separate policy matter that certainly merits careful consideration. For example, it has been argued that LECs subject to price cap regulation should be ineligible for any high cost support.²⁹ The Commission may well decide as a policy matter that there is no need to fund any high cost support for Tier 1 LECs.

28. *The Cost of Universal Service*, at 147. The analysis in this table does not reflect a correction for the penetration rate.

29. For further discussion of this issue, see Time Warner Communications Inc. Telecommunications Policy White Paper *Funding Universal Service: Maximizing Penetration and Efficiency in a Competitive Local Service Environment*, at 16-19.

1.5 The objective of a cost proxy model is to portray an accurate representation of universal service costs without capturing an exact likeness of actual LEC investments

The relationship of the results of the BCM to so-called “actual” costs is an inappropriate litmus test of the validity of the BCM that is propounded by several industry members. According to a commentary sponsored by BellSouth, “The BCM is most troubling because it does not depict the *actual* costs of an *actual* local exchange carrier.”³⁰ The NERA Comments criticize the BCM methodology for using nationwide, rather than carrier-specific, values for “critical cost inputs” and complains that the model incorporates “engineering practices that cannot be attributed to any particular carrier and [that] might not be feasible or optimal in particular circumstances.”³¹

Although the NERA Comments advocate using incremental, rather than reported costs, its recommendation still strives to put the incumbent LEC in complete control of how costs are specified for purposes of quantifying universal service support requirements. Accordingly, its recommendation suffers from many of the same weaknesses as the “actual” embedded cost. A principal objective of the cost proxy model is to be both forward-looking and carrier- and technology-neutral. As ETI has demonstrated, it is possible to achieve a “realistic” measure of forward-looking costs for the provision of basic telephone service without turning control of the inputs over to the incumbent LECs.

Similarly, optimization should not be constrained by the historic and strategic decisions of incumbent LECs. The NERA Comments fault the use of the “scorched node” assumption in the BCM, claiming that “[w]ith a technology and a network already in place, an existing carrier’s options for future technology choice and network optimization would be quite different from — and more constrained than — those faced by a new entrant into the local market.”³²

The costs being modelled are those for universal service, whether provided by an existing carrier or a new entrant. Many of the “real world” engineering practices of LECs reflect business strategies unrelated to their universal service obligations and which should not, in fact, be captured in the calculation of universal service support.

30. Kenneth Gordon and William E. Taylor, *Comments on Universal Service*, National Economic Research Associates, Inc. (NERA), September 12, 1996, at 38 (hereinafter, “NERA Paper”).

31. *Id.* at 37.

32. *Id.* at 38.

2 | CAPTURING A REALISTIC PORTRAYAL OF THE COSTS OF UNIVERSAL SERVICE

2.1 There is no basis to conclude that the BCM produces a lower bound for universal service support requirements

One criticism of the BCM is that optimization models, such as the BCM, estimate incremental costs that will usually provide only a lower bound on incremental costs and tend to ignore real-world details which cause actual incremental costs to exceed the models' estimates.³³ According to the BCM critics, these "simplifying assumptions" thus result in a computation of understated costs.

These unfounded conclusions about optimization models are directly contradicted by the results obtained by ETI in its detailed analysis of the BCM. Rather than showing a downward bias that models the *lower bound* of incremental costs, ETI demonstrated that the inputs and assumptions in the BCM produce results that should be considered an *upper bound*.³⁴ Even on a theoretical basis, the omission of "real-world" details can bias results up or down.

The original ETI Report identified and offered suggestions for addressing several attributes of the model where the BCM's theoretical engineering assumptions diverge from the less costly "real-world" practices of LECs. The "real-world" practices that the BCM should reflect are those that relate to the economically efficient provision of basic local telephone service. One specific aspect of the BCM concerns the way that it models the deployment of switches — the BCM grossly overstates switch costs by ignoring the substantial (and economically appropriate) presence of remote service units in the public telephone network. By way of illustration, NYNEX, one of the BCM's Joint Sponsors, serves a substantial portion of its approximate 500,000 lines in Maine with remote service units (RSUs): Of NYNEX's 143 wire centers in Maine, 127 are served by RSUs rather than

33. NERA Paper at 38.

34. *The Cost of Universal Service*, at 140-141; 179-180.