main frame switches.[35] The deployment of RSUs enables LECs to avoid substantial costs associated with software and hardware upgrades. In the context of the BCM, the implausible assumption that 100% of switches are host switches means that in our example of Maine, the deployment of 146 switches[36] — each at a fixed per-switch cost of $648,000 — grossly exaggerates the "actual" switch costs associated with the optimal provision of basic local exchange service. This phenomenon overstates the subsidy requirement in precisely those parts of the country where universal service support is most likely to be required, i.e., in rural areas. That NYNEX makes such extensive use of RSUs yet has sponsored a model that fails to reflect their prevalent use undermines the credibility of the BCM.[37]

Data provided by NYNEX in response to a USF Data Request in the earlier high cost proceeding (CC Docket 80-286) further corroborates the extensive use of RSUs in modern telecommunications networks. In 1993, 130 of the 149 NYNEX wire centers that served Maine were RSUs.[38]

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

Embedded costs necessarily reflect a LEC's "actual" engineering decisions which may not always lead to investments that are economically rational for the specific purpose of offering basic local telephone service. Engineering criteria reflect the total network requirements that are necessary, i.e., to support all present and planned telecommunications services, and thus requirements that go well beyond those necessary for basic telephone service. A model that purports to compute the cost of basic local exchange service should *only* incorporate network deployment decisions (e.g., the deployment of fiber in the feeder)

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35. FCC Report 43-07, January 1994 - December 1994.

36. The BCM "deploys" 146 host switches in the NYNEX region of Maine. BCM, Maine Data Input. The likely reason that the total number of switches modelled in the BCM is greater than the amount reported in the NYNEX ARMIS data is that the former source is based upon an earlier year and does not fully reflect more recent wire center consolidation.

37. The comments filed by eight states similarly observes that switching costs should be developed using differing switch sizes and architectures including host-remote configurations. Eight States Comments, at 6.

38. USF Data Request Submission Analysis Model, DATAREQ.WK4, Notice of Inquiry, CC Docket No. 80-286, In the Matter of Amendment of Part 36 of the Commission's Rules and Establishment of a Joint Board.

that are *economic* for the service being modelled rather than decisions that reflect a LEC's overall network engineering requirements.

As is discussed in detail in *The Cost of Universal Service*, several variables influence the economic crossover point for the deployment of fiber in the feeder plant, including the distance involved, the capacity being supplied, the cost of the digital loop equipment, the cost of fiber, and the cost of copper.[39] Also, as the distance of the outside plant increases, there may be a need for lower gauge copper and range extenders. Standard gauge copper, however, is likely to be adequate for feeder distances of less than 15,000 feet.[40] A total loop distance of 18,000 feet is likely to include approximately 12,000 feet of feeder and approximately 6,000 feet of distribution, and thus would not likely require a shift to lower gauge copper, and therefore, at a minimum, based upon the BCM's cost data for digital loop equipment, the crossover is at least 18,000 and likely a higher distance.[41] The BCM and its supporting documentation do not specify the copper gauge that is assumed, and, therefore, we cannot comment as to the extent to which the use of copper in feeder of relatively longer distances would require a lower gauge than that used in the BCM. For example, if the BCM assumes the use of 24 gauge copper in the feeder there would be no requirement to alter the gauge copper for the longer feeder distances that ETI tested. Presumably such information could (and should) be readily supplied by the Joint Sponsors. In any event, ETI's original analysis clearly demonstrates that the BCM's algorithm for determining when to deploy fiber rather than copper in the feeder plant requires a thorough examination.

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"

The Joint Sponsors have represented the BCM as a *public* model and have made a point of making the model widely available. In their Joint Submission of December 1, 1995, they stated:

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39. The BCM permits a user to alter *some* but not all of these variables; a user of the model can change the cost of copper, the cost of fiber, and the cost of the digital loop equipment, but cannot change the distance at which the crossover to fiber occurs. Furthermore, the algorithm does not incorporate a variable for the capacity being supplied.

40. Furthermore, in those instances where the distribution distance is more than 15,000 feet, the cost of deploying lower gauge copper and copper extension would be incurred regardless of the choice of technology for the feeder plant.

41. *The Cost of Universal Service*, at 110-116.

> In order that parties commenting in this proceeding [Docket CC 80-286] may have a common source of data which utilizes both the concept of the Census Block Groups (CBGs) and proxy costing, MCI, NYNEX, Sprint, and US West (Joint Sponsors) have worked together to develop a Benchmark Costing Model (BCM). ... The BCM is intended to provide the Commission, Joint Board, and other interested parties with information that can be used to evaluate the multiple proposals for the use of proxy methods set forth in the NPRM, including assessing the application of the proxy methodology to large companies only. ... *By making the model publicly available, the Joint Sponsors hope that the Commission, Joint Board and other interested parties will be able to obtain facts, data, and policy recommendations which will assist in the timely resolution of the important issues relating to universal service.*[42]

Consistent with that spirit of allowing industry members and policy makers to "kick the tires" of the BCM, ETI undertook to perform a series of sensitivity analyses of the proxy model and its key parameters, with the express purpose of contributing constructive criticism that could help to improve and to refine the BCM as a policymaking tool. In a sensitivity analysis, individual parameters are modified to determine the impact of such modifications on the overall quantitative results produced by the model. Such analyses are useful both in testing the overall robustness of the model as well as the relative importance of individual assumptions and quantitative inputs. The use of sensitivity analyses is a well-established technique that is widely used in the economics profession. It is likely that the model developers themselves conducted such analyses in the course of creating the BCM.

As discussed in ETI's original report, however, certain components of the BCM are only accessible with a password that the Joint Sponsors have not yet divulged.[43] The fact that the Joint Sponsors decided to "lock" certain critical assumptions upon which the model relies is a serious flaw in the BCM and detracts from its purportedly "public" status and credibility. ETI was forced to work around this limitation in order to conduct certain sensitivity analyses with respect to the economic assumptions incorporated into the BCM dealing with the use of copper vs. fiber optic cable in feeder plant. This was an important part of ETI's analytical undertaking inasmuch as the "locked" assumptions appeared to drive a major component of the costs represented in the model's results.

Upon noting that ETI had overcome the password obstacle to complete its sensitivity analysis, US West sent belligerent correspondence accusing ETI of "modifying" the BCM, and in so doing of violating the terms and conditions of the Joint Sponsors' "license

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42. December 1 Joint Submission at I-1 - I-2, footnotes omitted, emphasis added.

43. *The Cost of Universal Service*, at 29.

agreement" for use of the BCM.[44] Appendix 2 includes a copy of the letter from US West to ETI and a copy of ETI's response to that letter. In fact, in conducting its sensitivity analyses, ETI in no way "modified" the BCM. Rather, all that ETI did was to substitute different assumptions for those that the Joint Sponsors desired to "hardwire" into the model, in order to address and respond to the Commission's request for a critical and constructive examination of the potential usefulness of the BCM in guiding universal service policy deliberations.[45] As a result of that sensitivity analysis, ETI concluded that the fiber/copper "crossover point" assumed in the model was not economically based, and that the effect of the BCM's misspecified assumptions was to overstate, by a significant amount, the subsidy requirements for universal service. From the results of our sensitivity analyses and extrapolating to a nationwide basis, ETI estimates that the dollar impact of this misspecification is to overstate the universal service subsidy requirement by as much as $200-million annually.[46]

ETI has of course not done what US West has accused us of doing,[47] but US West's attempt to intimidate us into confining our examination of the BCM within the narrow limits that it would like to enforce should be a source of some concern for the Commission. The outcome of this proceeding will have a profound financial impact upon a broad range of telecommunications providers. In general, incumbent LECs such as US West will be net recipients of universal service funding, while new local service entrants and other telecommunications providers will be net contributors. It is clearly in US West's financial self-interest to portray as large as subsidy requirement as possible, and the particular selection of a 12,000 foot "crossover point" rather than the 18,000 to 21,000 foot distance that is the appropriate economic choice for basic analog voice telephone service (the defined "universal service" offering) is simply to exaggerate the funding requirement and potentially to impose unnecessary and burdensome costs on US West's competitors. It would be imprudent for the Commission to adopt a cost proxy model without evaluating this key assumption. The Commission should not tolerate efforts such as these to block an informed and rigorous analysis of the BCM.

As is discussed in *The Cost of Universal Service*, the crossover point is directly affected by the assumptions regarding the cost and discounts for fiber optic electronic

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44. Letter dated April 26, 1996, from Judson D. Cary, Attorney, Intellectual Property Law Group, US West, Inc. to Dr. Lee Selwyn, president of Economics and Technology, Inc.

45. NPRM at para. 31.

46. This comparison reflects the use of 27,000 feet for the crossover point to fiber with the BCM default value of 12,000 feet. It also reflects the forward looking cost factor and a $20 price support.

47. ETI has not "distributed" nor does it intend to distribute any "versions of the BCM" that reflect the various sensitivity analyses that we have undertaken.

equipment. If the crossover point of 12,000 feet that the BCM assumes is correct, then clearly the BCM's assumptions about costs for subscriber loop equipment are grossly exaggerated.[48] If, however, the BCM's assumptions about subscriber loop equipment are correct, then clearly the BCM uses a grossly uneconomic fiber/copper crossover point.[49] Because of the significant effect that these engineering and cost assumptions have on the BCM results, it would simply be irresponsible to accept the BCM's values and methodology at face value. ETI, by conducting sensitivity analyses of these aspects of the BCM, has simply identified critical areas for further examination and improvement. Although ETI has not itself modified the BCM, we certainly do recommend that – before the BCM is adopted in policymaking decisions – modifications be made to the BCM to correct the weaknesses that ETI has exposed.

2.3 The need for and size of high cost support should be examined at the wire center level

One critical component of modelling costs and computing the need for high cost support concerns the geographic area which should serve as the basis for evaluating eligibility for and the level of high cost support necessary for basic local telephone service. This important matter continues to be disputed. Several companies support the use of census block groups (CBG) as the appropriate geographic area.[50] Others advocate the use of wire centers as the basis for evaluating high cost support because network costs are incurred on a wire center basis.[51] At least one company advocates using the entire state which is analogous to the "study areas" currently being utilized to determine high cost support.[52]

The determination of the appropriate area substantially affects the magnitude of high cost support and the distribution of high cost support among large and small local exchange carriers. If a relatively larger area is used (e.g., the study area), there is a substantially greater likelihood that the relatively low-cost areas will offset the relatively high-cost areas. By contrast, if the geographic unit is excessively granular (e.g., the CBG), a greater number of lines will be in high-cost areas. In determining the size of the geographic unit to use as a basis for universal service support, policy makers should give substantial weight to the

48. *The Cost of Universal Service* at 112, 115.

49. *Id.*, at 110-117.

50. US West at 3, Sprint at 13, GTE at 9; Pacific Telesis at 18, footnote 33.

51. Ameritech at 12, footnote 24; BellSouth at 14.

52. BellAtlantic at 4.

fact that there are substantial economies of scale and scope associated with the provision of basic local telephone service. Those economies of scale and scope clearly extend beyond the CBG. Thus, the notion that the use of the CBG as the "study area" permits more precise targeting to where the subsidy is "really needed"[53] should be rejected because a CBG's excessive granularity overstates and misrepresents "need" by failing to reflect the substantial economies of scale and scope enjoyed by LECs.

Table 2.1

The Level of Aggregation Significantly Influences the Universal Service Funding Requirement Washington State (without corrections)

	USF Support (CBG)	**USF Support (Wire Center)**	**Difference**
$20 Support Level	$77,846,835	$65,268,857	(16%)
$30 Support Level	$50,692,629	$39,074,284	(23%)
$40 Support Level	$37,662,589	$26,137,066	(31%)

Note: BCM default values and forward-looking cost factor are assumed.
Source: The BCM, and accompanying Washington State data.

The original ETI Report discusses the need to evaluate high cost support at the wire center and provides a preliminary analysis of the sensitivity of the BCM results to this correction.[54] Table 2.1 and Table 2.2 summarize the results of ETI's further assessment of the impact of running the BCM so that costs are computed at a CBG level, but are then evaluated at a wire center level. Based upon the BCM's three price support levels of $20, $30, and $40, this change reduces the universal service support required by between 33% and 45% (relative to the results generated by ETI's partial corrections).

53. Pacific Telesis at 18, footnote 33.

54. *The Cost of Universal Service*, at 93-101.

Table 2.2

The Level of Aggregation Significantly Influences the Universal Service Funding Requirement Washington State (with ETI partial corrections)

	USF Support (CBG)	USF Support (Wire Center)	Difference
$20 Support Level	$26,662,873	$17,975,810	(33%)
$30 Support Level	$15,768,467	$9,665,278	(39%)
$40 Support Level	$10,356,266	$5,668,830	(45%)

Note: See page 158 of the original ETI Report for corrections.
Source: The BCM, and accompanying data from the state of Washington.

We have extrapolated from the Washington State results to provide an approximation of the impact of implementing this correction on a national level. Table 2.3 shows that support levels for the entire country would range between $200-million and $900-million if the need were examined at a wire center basis.

Table 2.3

Comparative Summary Results of the ETI Partially Corrected BCM
at the CBG Level and Wire Center Level
National (excluding Alaska)

	CBG	**Wire Center**	**Difference**
Annual Benchmark Cost	$13,121,356,822	$13,121,356,822	0%
Support at $20	$1,362,335,440	$918,471,278	33%
Support at $30	$685,403,415	$420,117,856	39%
Support at $40	$377,321,942	$206,539,109	45%
Average Monthly Cost	$12.08	$12.08	0%

Notes: ETI partial corrections do not include adjustment for penetration rate.
Source: ETI partially corrected results from Washington State are extrapolated to BCM national results.

Appendix 2 | CORRESPONDENCE FROM US WEST AND ETI RESPONSE

U S WEST, Inc.
7800 East Orchard Road, Suite 490
Englewood, Colorado 80111

Judson D. Cary
Attorney
Intellectual Property Law Group
Telephone: 303-796-6027
Facsimile: 303-793-6583
Internet: jcary@uswest.com

26 April 1996

(Return Receipt Requested)
Lee Selwyn
Economics and Technology, Inc.
One Washington Mall
Boston, MA 02108

RE: COPYRIGHT LICENSE TO BENCHMARK COST MODEL

Mr. Selwyn:

The Joint Sponsors (MCI, NYNEX, Sprint, and U S WEST) of the Benchmark Cost Model computer program (BCM) jointly developed and own all rights in the BCM. A limited license to *use* the BCM was granted to Economics and Technology, Inc. (ETI) under the terms and conditions of a software license agreement (a blank copy is attached). The software license agreement specifically reserves all other rights in the BCM, including the right to modify the program.

It has recently come to our attention that ETI published a report titled "The Cost of Universal Service: A Critical Assessment of the Benchmark Cost Model" dated April 1996 (see attached excerpt). In the report ETI states on page 112, footnote 166, that "The Main Logic Sheet of the Loop Module where the copper/fiber crossover algorithm is found is password protected. *We were able to overcome this restriction.*" (emphasis added). Such modification to the BCM is strictly forbidden under the terms and conditions of the license agreement.

Therefore, we request that all modifications to the BCM be delivered to U S WEST or certified destroyed. We also request written assurances of such delivery or destruction, and further written assurances that ETI will adhere to the terms and conditions of the BCM software license agreement.

If you would like to discuss this matter further, please contact me. I look forward to your prompt written response.

Sincerely,

Judson D. Cary

enclosures: excerpt of "The Cost of Universal Service: A Critical Assessment of the Benchmark Cost Model"
Benchmark Cost Model Order Form and Software License

THE COST OF UNIVERSAL SERVICE

A Critical Assessment of the Benchmark Cost Model

Susan M. Baldwin
Lee L. Selwyn

April 1996

ECONOMICS AND TECHNOLOGY, INC.
ONE WASHINGTON MALL • BOSTON, MASSACHUSETTS 02108

Post-it® Fax Note 7671	Date 4-24-96 pages 3
To Jud Cary	From PETER CODELAND
Co./Dept.	Co.
Phone # 796-6027	Phone # 896-4620
Fax # 793-6563	Fax # 896-9994

concur and believe feasible, have indicated their intent to correct the BCM accordingly."[75] Finally, because all of the algorithms, inputs, and formulas that are in the full model are also in the demonstration model, many of the attributes of the model can be readily evaluated through use of the demonstration model alone.[76]

ETI acknowledges password protection & confirms with Joint Sponsors

There is, however, one significant aspect of the BCM that belies its characterization as an "open" model and that frustrates efforts at pursuing a comprehensive and objective analysis. The Main Logic, Shared Allocation, Costing, and Output sheets of the Loop Module are password protected and cannot be adjusted by the user.[77] The Loop Module, as described above, is perhaps the most important of the BCM's three separate modules as it assigns plant types and costs to the outside plant portion of the network. Among the types of analyses that cannot be readily performed because of the password protection are the following:

- Adjustment of the 12,000 foot crossover point for the deployment of copper or fiber feeder plant.
- Alteration of the allocation of plant and structure costs among CBGs in the same quadrant.
- Adjustment of the plant costs associated with different size cables of all plant types.

cable costs can be adjusted

The overall credibility of the BCM is diminished by the Joint Sponsors' decision to "lock" these aspects of the model and to prevent their modification by other users. As we discuss below in Chapter 6, preliminary efforts to modify one of these three "locked" parameters — the copper/fiber crossover point — suggests that the BCM has adopted a fundamentally uneconomic decision rule that appears to result in a significant overstatement of the costs that are required by LECs to furnish primary residential access lines.

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75. *Ex parte* submission in CC Docket No. 80-286 by Glenn Brown, Executive Director—Public Policy, US West (" *Ex parte* submission"), January 26, 1996. *Ex parte* submission, February 21, 1996.

76. The difference between the demonstration model and the full model is simply the size of the database, which, in turn, affects the hardware required to run the model. The "Demo" can be run on an ordinary personal computer, whereas the full model requires substantial computer requirements. The full model is designed for use with up to 600,000 CBG input records while the demonstration model includes space for only 50 CBGs.

77. The Joint Sponsors consider the password proprietary to the developers of the model and thus will not divulge it to others. Conversations with Mark Bryant, MCI, March 27, 1996; Peter Copeland, US West, April 1, 1996.

the same household density, the first would be assigned a 2,000 foot fiber main feeder segment while the latter would be assigned a 10,000 foot copper main feeder segment.

We tested the implicit assumption that a 12,000 foot total distribution distance represents an economic crossover point for copper and fiber main feeder and determined through two different types of analyses that the BCM's 12,000 foot crossover point as presently constructed does not deploy the most cost effective network configuration. First, we ran the entire BCM using Washington State data and various crossover points for copper and fiber feeder plant.[166] Without altering any of the BCM's other user inputs we decreased the copper/fiber crossover point from 12,000 feet to 9,000 feet. Not surprisingly, this change resulted in an increase in the statewide average monthly cost from the default level of $16.94 to $17.84. We then increased the copper/fiber crossover point to 15,000 feet, again leaving all other user inputs and algorithms unchanged, and found that the statewide average monthly cost for Washington State decreased by $0.72 per month to $16.22. As illustrated in Table 6.5 below, the average monthly cost continued to decline as we increased the copper/fiber crossover point successively from 15,000 feet to 18,000 feet, to 21,000 feet, and finally to 24,000 feet. This analysis proves that on a statewide basis, the BCM's 12,000 foot copper/fiber crossover point, when used with the Joint Sponsors' default per line costs for SLC and AFC electronics of $500 and $350 (with the BCM's assumed discounts) does not lead to the most efficient network possible. Thus, the algorithm and the cost input data are contradictory: Our analysis shows that, if the cost data that the BCM assumes are realistic then the BCM's copper/fiber trade-off decision is uneconomic. Alternatively, if, for the sake of argument, the BCM's algorithm for the copper/fiber trade-off decision is "correct" then clearly the cost data are wrong.

We chose ... expensive ... cost ... not ... used ...

These changes have been made in isolation of the change in copper plant that would be necessary for the network to function. Obviously lower gauge cable is necessary, range extenders or copper carrier systems are needed to move the same fiber cross-overs to these distances.

166. The Main Logic Sheet of the Loop Module where the copper/fiber crossover algorithm is found, is password protected. We were able to overcome this restriction.

Is this a breach of the lic agreement.

Benchmark Cost Model* Order Form and Software License

Name: _____ Company: _____

Address: _____

Telephone: _____ Fax: _____

P.O. No.: _____

The above-identified parties ("Parties") hereby acknowledge receipt of one copy of the Benchmark Cost Model. The Parties agree that the charge for the Benchmark Cost Model is $100 (to cover production costs) to be billed at a later date.

The Joint Sponsors (MCI, NYNEX, Sprint, and U S WEST) of the Benchmark Cost Model hereby grant to the Parties a nonexclusive license to use the Benchmark Cost Model and it results. All other rights in the Benchmark Cost Model shall remain the property of the Joint Sponsors. No right to copy, reproduce, modify, prepare derivative works, sub-license, or sell the Benchmark Cost Model is granted. No maintenance, support, repairs, or fixes associated with the Benchmark Cost Model are provided.

THE BENCHMARK COST MODEL IS PROVIDED "AS IS." THERE ARE NO WARRANTIES EXPRESS OR IMPLIED INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE JOINT SPONSORS SPECIFICALLY DO NOT WARRANT THAT THE BENCHMARK COST MODEL OR ITS RESULTS WILL BE ERROR-FREE. THE JOINT SPONSORS ARE NOT LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT OR SPECIAL DAMAGES INCLUDING COMMERCIAL LOSS, HOWEVER CAUSED AND REGARDLESS OF LEGAL THEORY OR FORESEEABILITY, WHICH DIRECTLY OR INDIRECTLY ARISE FROM THE USE OF THE BENCHMARK COST MODEL.

Agreed:

_____

Signature

_____

Print Name

ECONOMICS AND TECHNOLOGY, INC.

LEE L. SELWYN
PRESIDENT

ONE WASHINGTON MALL
BOSTON, MASSACHUSETTS 02108
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May 8, 1996

Judson D. Cary, Attorney
Intellectual Property Law Group
US West, Inc.
7800 East Orchard Road, Suite 490
Englewood, Colorado 80111

Dear Mr. Cary:

We are in receipt of your letter dated April 26, 1996, in which you accuse ETI of having "modified" the Benchmark Cost Model (BCM) of which US West was one of four (4) Joint Sponsors, and demand that "all such modifications to the BCM be delivered to US West or certified destroyed."

ETI has not "modified" the BCM as you allege. We have conducted certain sensitivity analyses in the course of examining the BCM as part of our work for the National Cable Television Association (NCTA) in connection with the Federal Communications Commission's *Notice of Proposed Rule Making* in CC Docket 96-45. The work was done explicitly and for the limited purpose of testing the BCM and the validity of its quantitative inputs and underlying engineering and economic assumptions. Such an analysis was expressly requested by the FCC in the NPRM (at para. 31), and was invited by the Joint Sponsors themselves (including US West) when the BCM was issued in September, 1995. The nature of our sensitivity analyses is more fully described in the attached report that we have prepared for the NCTA and that is this date being submitted to the FCC. Please be aware that we are in that report advising the FCC of this attempt by US West to intimidate us into limiting the scope and extent of our examination and in so doing deny the FCC information as to a critical flaw in the BCM with potentially serious financial consequences for non-incumbent local exchange carriers and other telecommunications providers.

Sincerely,

cc: William F. Caton, Acting Secretary, FCC

3 | RESOLVING THE COST PROXY DEBATE

3.1 Pacific Bell's Cost Proxy Model

The California Public Utilities Commission is investigating two different cost proxy models for basic telephone service in the context of a comprehensive universal service proceeding. One model is the "Cost Proxy Model" (CPM), which has been submitted by Pacific Bell and the second model represents an enhancement of the BCM (the "Hatfield Model"), which has been submitted by some members of the California Telecommunications Coalition.[55]

Pacific Telesis touts its CPM as a flexible, customized cost proxy model that can be used at the federal level.[56] It further claims, in proposing that its model be used at the federal level, that its model "is programmed with the most accurate and technically efficient engineering parameters."[57] Despite this assertion, the CPM in fact suffers from various flaws, some of which are unique to the CPM and others that are also characteristic of the BCM. One of most serious weaknesses of the CPM (a flaw which is common to both the CPM and the BCM) is the deployment of outside plant with *substantial excess capacity*, in order to reflect engineering decisions relating to services other than primary line basic residential telephone service. The failure to incorporate *economic* rather than *engineering* criteria in the network being modelled is a fundamental shortcoming of the CPM. The universal service goal is satisfied by the provision of *one* primary residential access line to each household. *Any* cost proxy model that is adopted for the purpose of determining universal service funding support should incorporate network design decisions that reflect the least cost to offer basic residential local telephone service.

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55. See *The Cost of Universal Service*, at 169-175.

56. Pacific Telesis at 17.

57. *Id.*

Numerous specific problems have been identified with the CPM,[58] including, among others, the following:

- The CPM overstates loop costs because it reflects Pacific Bell's outside plant engineering practices for loop feeder facilities that are focused on a broadband-capable design.

- The CPM's assumption of a 9,000 foot crossover point for the deployment of fiber rather than copper in the feeder plant oversimplifies the engineering decision and thus the model is not likely to deploy the least-cost alternative.

- The low outside plant utilization levels assumed by Pacific Bell result in an overstatement of line costs.

- The CPM does not model the deployment of wireless technology where such an alternative might lower the costs.

- The CPM's digital central office switch costs do not reflect forward-looking investments.

One additional criticism of the CPM that has been widely noted is the fact the Pacific Bell's model depends on a significant amount of proprietary data.[59] Pacific Bell claims that this is no longer true, because it has developed a way of allowing nonproprietary input to the CPM. However, it admits immediately thereafter that its own results from the CPM "are proprietary since we have used proprietary costing information as an input."[60] Thus, while Pacific Bell has made its model more usable by others, as to its own running of the model it continues to rely on proprietary data. If every LEC utilizing a version of the CPM were to proceed in a similar manner, independent parties would confront a virtually insuperable obstacle of determining the validity of company-specific results based on proprietary data.

While the BCM has been undergoing scrutiny by a host of parties since it was filed in September 1995, the CPM is only now in the process of being evaluated, in a proceeding before the California PUC. Because of its significant shortcomings, the CPM should not supplant the BCM in the Commission's consideration of cost proxy models for use in the federal universal service proceeding. However, it is certainly appropriate for the Joint

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58. 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.

59. See NPRM at 33.

60. Comments of Pacific Telesis at 16-17.

Sponsors and the Commission to consider incorporating aspects of alternative models, such as the CPM or the Hatfield Proxy Model, if the changes are demonstrated to clearly improve upon the reliability of the BCM, without compromising the open and nonproprietary nature of the BCM.

3.2 Universal service funding should only encompass targeted subsidies where there is a well-documented need

Although US West, one of the model's sponsors, reiterates its support for the BCM,[61] it asserts that high cost funding is only one element of funding for universal service. According to US West, the purpose of a federal high cost fund is to recover some but not all of the difference between the price of basic service and the embedded cost of providing the service. US West supports the BCM approach as a way to target federal high-cost dollars.[62] Additionally, US West (as do other incumbent LECs) recommends that LECs rebalance their rates and also asserts that LECs are entitled to recovery of the costs associated with historical carrier-of-last resort obligations. US West recommends that this recovery be implemented through "service prices at the federal and state level, as well as federal and state explicit high-cost funds."[63] The incumbent LECs' self-serving attempt to recover theoretical depreciation reserves from their competitors through universal service funding should be rejected by state and federal policy makers for numerous reasons.[64]

In a related vein, NERA contends that the BCM is simply a tool for identifying but not quantifying high cost support.[65] Contrary to this assertion, the BCM — if corrected — can be used to determine (1) the *need for* and (2) *level of* universal service support that is necessary for specific regions in the country.

The level of universal service support that the BCM computes represents the entirety of the universal service funding requirement. Contrary to the assertions of several incumbent LECs, other than support for high cost areas, low income programs, and TRS programs, there is no other requirement for universal service support for basic residential telephone

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61. US West Comments at 9-10.

62. *Id.* at 12.

63. *Id.*

64. For a more detailed discussion of this issue, see *Stranded Investment and the New Regulatory Bargain*, Time Warner Communications Inc. Telecommunications Policy White Paper; California PUC R.95-01-020/I.95-01-021, *Universal Service Proceeding*, Rebuttal Testimony of Lee L. Selwyn, April 24, 1996, at 12-17.

65. NERA Paper at 37.

service. The Commission should reject LECs' attempts to inflate universal service requirements in order to shelter their revenues in the face of local competition.

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

While expressing support for the BCM generally, saying it has considerable promise, the joint filing by eight state public utility commissions suggests that the Commission should await the development of a "consensus" before substituting the cost proxy model for reported cost data.[66] There is an understandable dilemma between permitting full and detailed analysis of the model's attributes and reaching a reasonable conclusion within a reasonable time frame. In this process, however, it is important to prevent incumbent LECs from using delaying tactics to forestall adoption of the BCM in order to preserve reliance on historical embedded cost data in the "interim." Because of the difficulty in reaching consensus among all interested parties about all attributes of the model, the Commission should set a realistic target date to declare finality and go forward with the BCM.[67] If certain specific flaws in the existing version of the BCM are remedied, the BCM, 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.

66. Eight States Comments at 7.

67. Certainly, reasonable modifications and enhancements can continue to be made periodically in order to update cost data, reflect network innovations, capture significant shifts in population, and model other relevant changes.

CERTIFICATE OF SERVICE

I, Staci M. Pittman, do hereby certify that on this 7th day of May, 1996, copies of the foregoing **"Reply Comments of the National Cable Television Association, Inc."** were delivered by first-class, postage pre-paid mail upon the attached list:

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