mechanism, which conforms to FCC rules, is experiencing expected growth in fund size and is properly targeted.

The FCC released a Staff Paper in August, 1993 that called for the continued preservation of universal service. The Federal/State Joint Board and the FCC addressed the current size of the Universal Service Fund (USF) by establishing a indexed cap on the Universal Service Fund in 1993.

As a result of the interim cap, NECA filed revised rates on January 14, 1994, to be effective February 1, 1994 - June 30, 1994. The Universal Service Fund size using the indexed cap resulted in payments of $725.3M for 1994 versus an amount of $744M submitted to the FCC in October 1994.

On May 17, 1994 NECA submitted to the FCC its report of presubscribed lines for IXCs qualified as USF payers. These data were filed in conjunction with NECA's USF/LA Filing to revise Lifeline Assistance and Universal Service Fund charges billed to IXCs. This filing sets those charges at $.0901 and $.4295 per line, respectively, effective July 1, 1994 through December 31, 1994. This represents a net decrease per subscriber line per month of $.0053 from the combined rates then in effect.

On September 30, 1994, NECA submitted results of its 1994 USF Data Collection to the FCC. This report contained results of exchange carrier loop costs for the period ending December 31, 1993 and established high cost company expense adjustment levels for calendar year 1995. With the interim cap on growth for the high cost fund still in effect for 1995, the total fund size was increased to $749.2 million (1994 fund size increased by 3.28 percent to reflect growth in lines). Absent the cap, funding would have been $777.4 million, an increase of 4.8

percent over the prior year's uncapped level.

Numerous other interested entities including MCI, MFS, Teleport, AT&T, SWBT, USTA, NARUC have published papers regarding universal service issues. Internet on line discussions of this issue are also going on at the Benton Foundation and the University of Pittsburgh. In October 1994 the Telephone Industry Analysis Project (TIAP) reported out the paper Beyond Cost Allocations: Benchmark Subsidy Method. The purported purpose of this Project was to provide information to support the development of alternative telecommunications policies to meet the needs of stakeholders in an environment that includes competitive and non-competitive markets, federal and state regulatory jurisdictions, and to produce research and analysis which will assist policy makers in making informed decisions. The TIAP is affiliated with the Public Research Center, College of Business Administration, University of Florida. Prior to 1993, the project was known as the Alternative Costing Methods Project. Private industry provided funding has continue to support the project from year to year.

On November 17, 1994, NECA submitted revised USF ($0.4335 per presubscribed line per month) and Lifeline Assistance ($0.0848 per presubscribed line per month) rates to the Commission to be in effect for the period January 1, 1995 through June 30, 1995. These changes, permitted to become effective January 1, reduced the combined charge to the qualified interexchange carriers by $0.0013 per presubscribed line per month.

NECA submitted its semiannual revision to USF and Lifeline Assistance charges on May 17, 1995, to be effective for the period July 1, 1995 through December 31, 1995. The proposed changes in rates of $0.4214 for USF and $0.0936 for Lifeline Assistance would further reduce the composite charge to the interexchange carriers by $0.0033 per subscriber line per month.

On August 30, 1994 the FCC issued a Notice of Inquiry (NOI) regarding High Cost Assistance. Comments were submitted on October 28, 1994 and reply comments on December 2, 1994.

Approximately 150 parties filed in this docket, with a wide variety of viewpoints represented. There was general agreement that:

1) A comprehensive review of all universal service issues, including implicit support, is needed;

2) The definition of universal service should not be expanded; and,

3) All providers should contribute to universal service support.

However, there were areas of disagreement. For example:

While small local exchange carriers (LECs) believe the current USF works well and requires no fundamental change, interexchange carriers (IXCs) felt that the USF was too large, and

Some parties felt that Price Cap/Tier 1 LECs should be ineligible for high cost support, while others believe that all providers should be eligible.

In the August 30, 1994, NOI of the FCC also sought comment on the effectiveness and efficiency of the USF and DEM mechanisms, and the manner in which Part 36 rules are used to provide interstate assistance to LECs. Comments were due October 28, 1994 and replies on December 2, 1994.

More than, 144 parties filed comments in this proceeding. Generally, the regional bell operating companies (RBOCs) argued that the proceeding was too limited and needs to address the much larger issues of maintaining universal service in a competitive environment. They therefore recommended that the FCC initiate a comprehensive proceeding to investigate all funding mechanisms. The IXCs argued that the growth in high-cost assistance is excessive, and

should be controlled through more targeted approaches. They and competitive access providers (CAPs) supported the concept of a voucher system. Many small LECs and state regulators presented "successes" of the USF, noting that policy is working. They also maintained that support should be determined on the basis of actual costs.

On December 1, 1994, the FCC issued a mandatory Universal Service Fund data request in Docket 80-286 to all telephone companies that provide telephone exchange service. The purpose of the data request is stated to be to "enable the Commission, State regulatory agencies, LECs, IXCs, and other interested parties to estimate the financial effects on various assistance mechanisms". Depending on certain qualifications, the completed Files 1 through 4 of the data request are due to the FCC on February 1, 1995 and/or March 1, 1995.

On July 13, 1995, the FCC released a Notice of Proposed Rulemaking (NPRM) and NOI proposing revisions to the FCC Part 36 jurisdictional separations rules regarding high cost assistance mechanisms. Specifically, the FCC requested comment on several alternatives for revising DEM weighting and USF rules, including such ideas as modification of current rules and thresholds, combining the current programs, instituting a proxy factor system, and issuance of high cost credits. The primary focus of the alternatives was to reduce the amount of high cost support provided via DEM weighting and USF mechanisms. Restructuring Universal Service support to address the larger issue of the amount of the current implicit support flows embedded in LEC rates, which are subject to erosion by competitive forces, was not addressed in that docket.

Approximately 175 parties filed comments, which were due October 12, 1995, in this proceeding. Reply comments are due on November 12, 1995.

Approximately 50 parties filed reply comments on November 10, 1995. Subsequent to that, several parties have filed ex partes containing data analyses in support of their positions on the NPRM issues regarding the USF, DEM weighting, proxies, benchmarks, etc.. It was during the context of these ex parte presentations that the joint sponsors of the first bench mark pricing model filed that model with the FCC and Joint Board.

On December 8, 1995, the Docket 80-286 Joint Board issued a Recommended Decision to extend the interim cap on USF an additional 6 months until July 1, 1996 which was accepted by the FCC on December 12, 1995.

Many parties agreed that a reworking of the current Part 36 support mechanisms, upon which the July 1995 NOI was based, is a commendable undertaking. However, most LECs, competitive access providers, and IXCs called for a more comprehensive review of universal service issues. Some other more predominant comments made were:

> States commented that they want to play a major role in administering the support funds (other parties were less enthusiastic about State distribution of the funds). Some States disagreed, however, on the use and appropriateness of proxies and high cost credits.
>
> IXCs, competitive access providers, and cable TV providers generally argued for the elimination of DEM weighting and large cuts in USF support. LECs generally argued the opposite.
>
> LECs were split on the use of proxies.

On February 8, 1996 the President signed into law the Communications Act of 1996. This act changed the course of universal service activities. The FCC on March 8, 1996 released and NPRM on universal service and established a new Joint Board in Docket 96-45 to review the universal service issues under the new act.

Most of the papers and party positions regarding universal service, including those included in the works cited here in, have been posted on the Energy and Regulatory Matters Information Service (ERMIS) Bulletin Board (517-882-0021 or telnet ermis.state.mi.us) managed by the staff at the Michigan Public Service Commission.

CHAPTER 1

UNIVERSAL SERVICE CURRENT EVENTS

The Events Post 1996 Federal Communications Act

On February 8, 1996 the President signed into law the Communications Act of 1996. This act changed the course of universal service activities.

Section 254(a)(1) of the *Communications Act*, as amended, requires the Commission to "institute and refer to a Federal-State Joint Board under section 410 (c) a proceeding to recommend changes to any of its regulations in order to implement sections 214(e) and [Section 254], including the definition of the services that are supported by Federal universal service support mechanisms and a specific timetable for completion of such recommendations."

The FCC on March 8, 1996 released and NPRM on universal service and established a new Joint Board in Docket 96-45 to review the universal service issues under the new act.

The Joint Board in CC Docket 80-286 and now in 96-45 have compiled a extensive record of parties concerns on how universal service should be funded. Various options have been put forward for determining what should be funded. Some of those options are: actual cost (% of cost over a specified amount), vouchers customers, models (Bench Mark Cost Model 1 (BCM1), Bench Mark Cost Model 2 (BCM2), Hatfield Model (Hatfield) and Cost Proxy Model (CPM)),

and customer discounts (lifeline 1, lifeline 2 and linkup).

The March 8, 1996 NPRM states the FCC's initiative to 1) define the services that will be supported by Federal universal service support mechanisms, 2) define those support mechanisms, 3) otherwise recommend changes to current regulations to implement the universal service directives in the 1996 Act.

The NPRM set forth seven principles enunciated in Section 254(b) of the 1996 Act for establishing a mechanisms for collecting and distributing funding essential to achieve the universal service goals. The goals identified were:

1. the concept of "quality services" utility of performance-based measurements to evaluate our success in reaching that Congressional objective to ensure that quality service be available at "just, reasonable, and affordable rates";

2. foster access to advanced telecommunications and information services for "all regions of the Nation;

3. consumers in "rural, insular, and high-cost areas" and "low-income consumers" should have access to "telecommunications and information services" that are "reasonably comparable to those services provided in urban areas." In light of the further legislative intent to "accelerate rapidly private sector deployment of advanced services to all Americans;

4. support mechanisms for universal service and should guide efforts to establish those mechanisms through which funding essential to realizing the universal service goals will be collected and distributed. This calls for "equitable and non-discriminatory contributions: from "all providers of telecommunications services";

5. "support mechanisms should " be "specific, predictable and sufficient";

6. "elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services; and

7. Section 254 of the new legislation authorizes the FCC and the Federal-State Joint Board to base universal service policies on "[s]uch other principles as [they] determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act."

The NPRM also asked which services should be supported, how to implement explicit support mechanisms, how to determine affordability, how to calculate the "subsidy", the use of cost proxy models, the appropriateness of DEM weighting rules, how to define service areas, and specific recommendations for low-income customer support - including toll limitation services, Lifeline and Link Up America programs. Comments were submitted on April 12, 1996 and reply comments May 7,1996. It was in response to this portion of the NPRM that proponents of the BCM and later the Hatfield Model proposed that these models be used as a substitute for book cost in order to determine eligibility and amount of support provided for universal service under section 254 of the 1996 Communications Act.

Approximately 250 parties provided Comments to the NPRM in the following areas: (1) goals and principles of universal support mechanisms, (2) support for rural, insular, and high-cost areas and low-income consumers, (3) support for schools, libraries, and health care providers, (4) enhancing access to advanced services for schools, libraries, and health care providers, (5) other universal service mechanisms, and (6) administration of support mechanisms. Although most of the parties agreed on the need for universal service support these was no clear cut solution to the universal service problem. Disagreement exists over scope of the fund, interstate only or both interstate and intrastate, and the method used to determine the size of the fund, with alternatives ranging from a fully distributed cost basis to some form of total service long-run incremental costs (TSLRIC). While most parties agree that universal service should be funded on a competitively neutral basis, alternatives for the funding basis include total revenues, total retail revenues, interstate only revenues, and total revenues - net of payments to other carriers. Support of education and health care is generally supported by the parties, but vast differences exist in the

scope of the funded services, from basic access up to inclusion of terminal equipment (computers, etc.) on a wide spread basis. Significant concerns are raised about the costs and who would fund these programs.[1] While many parties supported the idea of using proxy models to determine high cost support amounts, no parties except the sponsors of the various proxy models supported their use, because of the numerous deficiencies in the models.

Over 100 parties provided Reply Comments, with many reiterating points made in their Comments. A number of state commissions filed a Joint Reply which stated that the NPRM is very broad and lacks specificity and that a supplemental NPRM should be issued with specific proposals and definitive rules. The Joint Reply also stated the fund size should not be limited, but be adequately sized and that more time should be provided to allow development of the models presented. Also the distribution of universal service fund support should be based on a measure of costs rather than rates, since there is significant variation in rate design methods/policies among and even within states.

The Joint Board held an open meeting on June 5, 1996 to address how much support would be required for rural high cost areas, low income consumers, and how to pay for it. A panel discussion addressed Cost of Support; a second panel discussed Alternatives for Recovering Costs & Providing Universal Service Support. Also on June 5, 1996, the FCC announced the membership of its Telecommunications and Health Care Advisory Committee which will report to the Joint Board by September of 1996. Another open meeting was held on June 19, 1996 with panel discussions on Schools & Libraries and on Health Care.

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[1]Briefing binder of Jurisdictional and Universal Service Issues for the Joint Boards and Staff, NARUC Summer Meetings, Los Angeles, July 1996

On July 3, 1996 the Common Carrier Bureau, at the request of the staff of the Federal-State Joint Board, issued a Public Notice requesting cements on a list of 72 questions. These questions related 1) Definitions Issues, 2) Schools. Libraries, Health Care providers, 3) High Cost Fund, 4) Proxy Models, 5) Competitive Bidding, 6) Benchmark Cost Model (BCM), 8) Cost Proxy Model Proposed by Pacific Telesis, 9) SLC/CCLC, 10) Low-Income customers, and 11) Administration of Universal Service Support. Comments were due on August 2, 1996.

On July 10, 1996 the Common Carrier Bureau, at the request of the staff of the Federal-State Joint Board, issued a Public Notice requesting further comment on cost models. Comments were due on August 9, 1996. Summaries of the comments related to proxies are contained later in this paper.

The FCC Staff issued data request letters on August 2, 1996 to the sponsors of the different proxy models. The letter calls for replies by August 16, 1996 to be filed in the record and provided to the Joint Board. As of the writing of this paper the comments have not been filed.

CHAPTER 2

ANALYSIS OF PROXY MODELS

INTRODUCTION

The telecommunications industry has had for years engineering models. The models have been used to design the facilities needed for specific constructions projects. Proxies (models to project the anticipated cost for building a telecommunications network to provide service to a given geographic area) are theoretically possible, however the plans presented in the record to date are drastically simplified, intended for only universal service fund identification purposes and not designed for pricing, cost allocations and revenue requirement determination and even the best one of the models is seriously flawed. The regulatory staffs, working with the companies, have identified a set of multi-dimensional proxies that could theoretically work. These ideas account for the many changes form the benchmark cost model 1 (BCM1) to benchmark cost model 2(BCM2). Many parties dtill believe that proxies, while theoretically possible, will require considerable testing. That additional testing and analysis will not be done for some time.

The analysis and comments to follow will focus primarily on BCM2 which is copy righted and some what difficult to manipulate because it has protected programing. The reason

for this is that BCM1 has been withdrawn by its sponsors from consideration, the CPM model has not been provided publicly (the data and perhaps the model are confidential and proprietary) for comprehensive analysis and therefore only perfunctory review can be made. We have not devoted much discussion to the Hatfield model because a fairly preliminary analysis of the model indicates that its results (as shown in chart attached) deviate so greatly from actual costs that the model can't be taken seriously at this time without detrimental effects on the current providers of telephone services.

PROXIES

A number of parties including U.S. West, GTE, Pacific Tel, MCI, AT&T and others advocated the use of some kind of a proxy method, at least as a transitional approach, to determine the level of high cost funds that should be allocated to any given geographical area. GTE recommended that the proxy method should ultimately be replaced by a bidding mechanism. Numerous other parties recommended rejection of the use of proxies alleging that no system of proxies could accurately predict high cost.

The primary reasons proxy methods are desirable include the fact that they are less susceptible to manipulation than "book cost" based funds, the fact that they are more compatible with a competitive environment, because they can be used to better target customers in some study area units that are actually high cost and the fact that they are more related to the cost of providing service in the future because they are not tied to past (embedded) costs.

The first proxy method proposed by U.S. West was based primarily on density per square mile and distance of the subscribers from the wire center as indicators of high cost. U.S.

West used its proxy method to determine the cost for each census block. It then proposed to use those costs to determine eligibility for High Cost Funds on a census block by census block basis. U.S. West tested the accuracy of its proxy approach by comparing the cost developed using the proxy to the costs derived using a model developed by RAND. There were problems with both the substance of the U.S. West model and the manner by which it is tested by U.S. West. US West agreed that there were problems and major modifications were required and resulted in BCM1 model being developed.

The primary deficiency with the first U.S. West model was that several factors other than density and the distance customers are from the wire center, appear to contribute more to any given area having high cost. An examination of data provided by some companies using the U. S. West model for locations in the midwest shows that the first U. S. West model which was solely based on density and distance from wirecenter had little Correlation to high cost. An examination of study areas having similar book costs but different densities further demonstrates this fact. Initial examination by many parties revealed that other characteristics may be closely related to costs. One factor that appeared to have a great effect on cost is the topography of the area being served. Some other factors that were identified as being related to causing high cost include the size of serving wire center, road accessibility, climate, whether the area is served by an Rural Utility Services borrower, the area's distance from a fairly large population center, and vintage of facilities.

The U.S. West test for accuracy of its first proxy method was problematical because its proxy based costs were not compared to "real" or "embedded" costs but were compared to other proxy derived costs. Because the RAND costs development model contained the same primarily

dependant variable as the U.S. West proxy (density) it was not surprising that the proxy appeared to correlate with the "costs" that are developed using the Rand model. Many parties reviewing the first study advanced the position that In order to determine whether a proxy factor is usable it must be compared to book costs or other "real costs" developed using some primary dependant variable other than the one underling the proxy itself.

The GTE proposed a model that used proxies for sub-study area units as a transitional high cost fund allocation method. Its method proposed to "correct" for deficiencies in the proxy method by using a factor to "true up" the sum of the proxy derived cost for all the census blocks in a study area to the book costs for each study area. That frozen factor would then be used in the future to adjust the proxy derived costs for any sub-study area unit.

The deficiency with this method is the fact that the average ratio between the sum of the proxy derived census block costs and the book costs for the entire study area will not likely represent the ratio of any given individual census blocks to its book cost unless all the census blocks in the study area are homogeneous. The more homogeneous a study area is, the more truing up using the GTE method, will either overstate or understate the cost for any given census block.

General Comments on the Application of Models

The models estimate cost on a total service unseparated basis. The models are proposed by most parties for the purpose of determining what portion of universal service support fund should be supported through the Federal plan. The models assign all loop costs on a unseparated basis to dialtone lines for the purpose of choosing an appropriate level of the Federal affordability

benchmark. While this may be appropriate for the purpose of determining the need for Federal universal service funds, this same methodology should not be used for the purpose of setting either Federal or State rates for any services including local exchange service, even if the models were perfect. The models allocation of all loop costs to local exchange services may also be contrary to admonition in section 254(k) of the Act which does not permit the assignment of all joint costs to services receiving universal service cost support.

The proxy models do not capture unique characteristics such as: glaciers, permafrost and ice effects; the lack of road system; limitations placed on surface transportation and construction due to Arctic conditions; and high labor costs. If a proxy model is used, then select a model that is sound from engineering and economic perspectives. In this regard, both the BCM2 and CPM models are superior to the original BCM model or the Hatfield model. BCM2 model and the CPM model might be merged into a single model that may have results that more closely replicate actual engineering and as built costs.

The use of actual wire centers or sub wire centers areas reflecting actual serving topologies is preferable to CBGs. The proxy methodology should study a geographic area which matches the actual network design for which costs are incurred. Since the standard upon which the proxy models are being judged is their ability to replicate actual costs, simply use actual book costs may still be preferable and should always be used as a test by which to evaluate model reasonableness. Universal service support should be based on book costs until such time as a workable model can be developed.

Rural companies should be allowed to obtain universal service support based on actual book costs instead of proxy costs for the time being, because errors in the existing models could

endanger the continued existence of universal service in rural areas and could irreparably impact the public health and welfare of persons residing in those areas. Further more the Act requirement of comparable service at comparable rates could be seriously undermined if unproven proxies are employed for small companies in rural areas. Rural companies should transition off of book costs if and only if it can be demonstrated that the models reflect the cost of small companies and if there are streamlined waiver procedures to use alternative methods.

Until the various inputs to the models can be demonstrated to have a direct correlation to cost causality and its magnitude, proxy models are not appropriate for determining prices. All the models are replete with unproven assumptions and factors where the relation of those factors to cost have not been demonstrated.

There is a concern with the fact that all the models construct an optimal network which is unrealistic and impossible to create in the real world. For example all the models assume that all portions of the network will be built simultaneously and will not necessarily meet actual service demands. Further more all the models make no provision for less than optimal externalities which are experienced by all operating telephone companies. Failure to recognize these real externalities and network design constraints will seriously under estimate cost and possibly make it impossible for companies to be able render affordable reliable telephone service.

The various proxy cost models that have been submitted are generally quite complex, having variable inputs, tables, and calculations, and neither sufficient time nor sufficient information about the models has been provided to perform a detailed review of any of them. The wide disparities in the models' cost outputs support parties position that universal service support calculations should be based on an eligible carrier's actual costs for the time being until better

models can be developed. Further more if making a workable proxy turns out to be more complex than reviewing or designing facilities and pricing them out, then the effort to do this should be reconsidered.

Proxies should be judged on the following criteria:

(a) easy to administer and simple to implement

(b) reasonably reflect actual costs in order to ensure that support is "sufficient"

(c) appropriately relate costs and support levels

(d) reflect cost differences that actually exist geographically by LEC

(e) compliance with the substantive requirements of the 1996 Communications Act

Proxy cost models should satisfy the following criteria:

1. Model should be publicly available and easy to understand and operate.

2. Inputs and outputs should be reasonable.

3. The network designed by the model should be capable of evolving into a network which in th efiture can provide high quality voice, data and video service to the extent as required by the 1996 Act.

4. The model should accurately reflect the elements which it purports to reflect.

5. The model and its application to the targeting of high-cost support to specific geographic areas should assure the continued provision of affordable basic telephone service and encourage the efficient evolution of local competition.

Bench Mark Cost Model

The flaws in the BCM include:

(a) the assumption that all households are evenly distributed throughout the census block group in which they are contained was partially remedied by shrinking the census block

group squared size but is still a problem because it still does not reflect the actual plant construction to meet demands for customers who's locations are usually somewhat clustered around certain serving areas ;

(b) uses census block groups which in many cases do not represent the way geographical areas are served. LEC networks are constructed and, hence costs incurred, on a wire center or serving area basis;

(c) many census block groups are assigned to the wrong wire center or to a wire center physically not capable of rendering service (ie. Across a high mountain or on the wrong side of a body of water).

(d) In the BCM, algebra is used to develop loop lengths and cable size, these inputs are not explained or verifiable at this time.

(e) BCM2 vastly underestimates the impact of loop length caused by slope. The magnitude of the slope multiplier is not large enough, it should large enough to convert the point to point distance calculated in the model to route miles of plant.

(f) The models proponents need to provide more documentation about their models, including data sources and specific algorithms for arriving at each of the user-defined input values.

(g) The switching costs used in BCM2 are not appropriate for rural areas where customers must be served by very small switches or remote. Recommend that per line switching costs be modeled for switches having less than 100 lines, 100 to 500 lines, 500 to 1000 lines, 1000 to 5000 lines and 5000 to 10000 lines.

(h) The higher costs of operation and maintenance in remote areas are not reflected in

BCM2.

(i) Use of a road system to determine where households are assumes that if there are no roads the are no people. That is incorrect.

(j) BCM2 caps loop costs at $10,000, assuming that wireless would be used for areas with costs above that. However, it may be impossible to serve those people with wireless service due to technical, environmental or logistical problems, including the lack of electricity.

(k) BCM2 also assumes the same traffic factors exist nationwide, even though the nature of traffic is significantly different between serving areas around the country.

(l) BCM2 does not attempt to model specific interoffice network costs.

(m) BCM2 plant specific annual cost factors are lower than the ARMIS factors in BCM. There is no documentation for these lower factors.

(n) BCM2 includes remote switches, which is an improvement over BCM, however, BCM2 merely places remote according to current practices rather than determining where a remote should replace a small stand alone unit.

(o) The model assumes square CBGs which under estimates the loop costs to the extent the CBGs are not square.

Despite the fact that BCM2 needs to be modified and justified substantially to make it usable for even high cost fund determination purposes, it is, in our opinion, the only model that has any hope of being useful. The other models are so seriously flawed that we do not believe any amount of work or modification can remedy their serious deficiencies.

California Pricing Model (CPM)

Parties claim that CPM is little more than a spreadsheet on which are collected input values based on proprietary data, undocumented judgements or assumptions and the outputs of other models. CPM reflects embedded rather than forward-looking costs. CPM's inconsistent use of terrain modifying factors artificially inflates loop investment costs. CPM bases central office switch and feeder costs solely on average population density of the grid, ignoring the number of lines serviced by the switch, and employs unrealistically short depreciation lives.

Parties comments state that the switching costs in the CPM do not fully capture the deference in unit costs between large and small switches and the level of costs used by Pacific are not representative of those experienced by other companies because of unique contracts Pacific has negotiated with its switch suppliers. This is a common complaint about all the models.

CPM has drawbacks which limit its application on a national basis. On of the most obvious drawbacks is the fact that CPM employs proprietary data on the location of all residential and business customers

Hatfield Model

One major concern of the BCM 1 is the use of multiplicative factors to drive most of its costs as a function of materials costs, the incorrect specification of structure costs as a function of cable size, and the distribution plan algorithm. The model places 400 pair cable in places that are actually likely to be served by 25 pair cable. While many concerns have been addressed in BCM 2, these concerns are worth noting because they are still contained in the Hatfield Model, which is based on the BCM1.

This model suffers from numerous deficiencies:

(a) It would appear that the revisions to the Hatfield model are result driven and the model can be adjusted to produce whatever cost answer its sponsors desire.

(b) Fill factors are too high, costs of capital are too low and depreciation rates that are too slow.

(c) The model does not seem to have been run through the set of theoretical and empirical tests that are routinely used to ferret out modeling errors.

(d) The model like BCM1 from which it was derived contains a anomaly; doubling the price of cable results in a near doubling of the cost of installation. Thus, under estimates for material needs or costs are amplified by the model.

(e) The model does provide estimates sufficiently accurate for use by small companies because of the wide variation from actual experienced material costs.

(f) The model seems to use unrealistic switch prices and installation costs.

(g) The model employs unrealistically low cable facilities costs.

(h) Hatfield omitted certain costs such as engineering and cable splicing costs.

(i) Hatfield does not model the current methods of deploying distribution plant.

(j) The Hatfield model uses copper for very long loops but does not provide for conditioning, amplification, or loading costs.

(k) The model uses a mathematical construct to determine customer locations without demonstrating that the resulting locations in any way match reality.

Most importantly the results of Hatfield do not even pass a "straight face test". Although we would never expect the results of any proxy to match net book costs, the results of

the Hatfield model do not even come close to correlating to the order of magnitudes of net book costs. As can be seen from the comparison of the models revenue requirement per month with actual revenue requirement data: the ratio between the highest of $26.46 for Mississippi and the lowest California which is $13.49 is less than two to one. While the ratio of the highest from the actual loop costs from the monitoring report which $32.83 for Wyoming to the lowest of the District Of Colombia which is $6.42 which is over five to one. Further more, the lowest and highest cost jurisdiction under the Hatfield model, which are California and Mississippi respectively, are far from the lowest and highest cost jurisdiction based on actual loop cost data that is available publicly.

CHAPTER 3

SUMMARY OF PARTIES COMMENTS

Brief Summary of Issues

Alaska PUC

Rural companies should be allowed to obtain universal service support based on actual book costs instead of proxy costs.

Rural companies should transition off of book costs if and only if it can be demonstrated that the models reflect the cost of small companies and if there are streamlined waiver procedures to use alternative methods.

The proxy models do not capture unique characteristics such as: glaciers, permafrost and ice effects; the lack of road system; limitations placed on surface transportation and construction due to Arctic conditions; and high labor costs.

Ameritech

Supports the use of actual wire center costs, not the use of any proxy model.

A wire center should be used because it is the basis upon which network costs are incurred.

Since the standard upon which the proxy models are being judged is their ability to

replicate actual costs, simply use actual book costs.

When proxy models are improved, but should not be used to size the US fund.

AT&T

Only a model that keeps subsidies to the minimum levels necessary to provide affordable service in high cost areas.

The Hatfield model is a flexible, publicly available model that estimates the economic costs of providing basic narrowband services. It is based on a modular and open architecture in which the vast majority of critical data inputs are user adjustable. The model uses many default values out of necessity because ILECs have refused to provide more accurate data. Contrary to criticisms of the model, in simulating the construction of an efficient network that would be built in a competitive environment, Hatfield incorporates realistic assumptions concerning present abilities to adopt and implement efficient, cost-minimizing production techniques. It uses actual minutes of use and access line numbers reported by the ILECs and models the network from existing ILEC wire center and STP locations. The local service cost estimates produced by Hatfield reflect all of the forward-looking costs of installing, maintaining, and operating all facilities necessary to supply basic residential service, including shared costs.

BCM1 only estimates loop and switching capital costs, and does not include algorithms to calculate the cost of other facilities necessary to provide basic telephone, e.g., interoffice facilities). The most basic flaw in BCM1 is its undocumented assumption that existing networks are sized efficiently to provide basic telephony services. BCM1 uses fill factors as low as 25%,