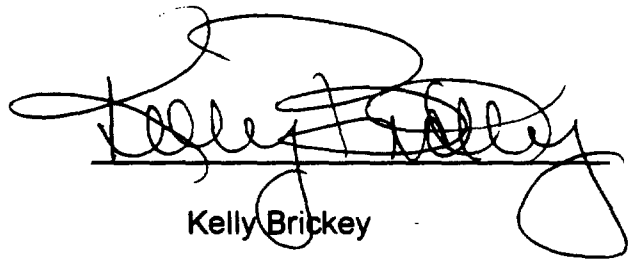
During that time, either the fill factor or the cable size must depart from their efficient levels. In fact, if the network growth is constant over time, the above demonstrates that the average fill factor or the average cable size must be one-half of the efficient levels when averaged over the construction time.

Construction time is clearly relevant in the "scorched node" approach used by the Hatfield Model. The network must still be constructed and this takes time. The only circumstances in which a reconstructed network could use ideal fill factors and cable sizes over the entire construction period are (i) if only a fraction of the customers are served during construction, permitting an idealized roll-out over time, or (ii) if customers demands coincidentally arise in a pattern which permits ideal construction (this means that subdivisions, for example, become fully occupied in sequence, permitting construction to proceed subdivision by subdivision, in sequence). The first case of only satisfying some customers' demands is unacceptable as a matter of policy and sound business. The second case will of course not occur as customers' location decisions are not that orderly. Only a fully dynamic model is capable of capturing the costs of constructing a real network to serve real customers in real time.

An additional point worth mentioning is that uncertainty has been ignored in this analysis, and the fact that the final demand is uncertain during construction only compounds these problems with the Hatfield Model. Incumbent LECs have constructed, and continue to construct networks, without knowing the final number of lines to be served in each CBG, but the Hatfield Model is based on using the known demand for lines. Choosing fill factors less than 100% partially addresses this uncertainty, but it is not adequate treatment of this factor. This issue is probably of secondary quantitative importance, although it bears directly on the important qualitative issue of incumbent LECs bearing all the risk of infrastructure development without receiving a return commensurate with that risk.

CERTIFICATE OF SERVICE

I, Kelly Brickey, hereby certify that the foregoing " Comments of Southwestern Bell Telephone Company.", has been served February 18, 1997, to the Parties of Record.



Kelly Brickey

February 18, 1997

INTERNATIONAL TRANSCRIPTION SERVICE
2100 M STREET NW
ROOM 140
WASHINGTON DC 20037

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Cost Models in	)	
Universal Service Notice	)	CC Docket No. 96-45
of Proposed Rulemaking	)	CCB/CPD 97-2

MOTION FOR LEAVE TO FILE COMMENTS OUT OF TIME

Sprint Corporation ("Sprint") respectfully requests leave to file the attached Comments, which were due Tuesday, February 18, 1997, out of time.

Due to computer communications transfer problems between Sprint's Westwood, Kansas headquarters and its Washington, D.C. office, the attached comments could not be relayed and edited in a timely manner.

To ameliorate any concern raised by the short delay in Sprint's filing, Sprint will serve, by hand or by overnight delivery, all those on the attached service list, which includes the Federal-State Joint Board members and staff, FCC Universal Service Branch staff, and industry parties participating in the Universal Service docket.

Accordingly, Sprint respectfully requests leave to file the attached comments in this important matter out of time.

Respectfully submitted,

SPRINT CORPORATION

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Its Attorneys

February 19, 1997

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Cost Models in	)	
Universal Service Notice	)	CC Docket No. 96-45
of Proposed Rulemaking	)	

COMMENTS OF SPRINT CORPORATION ON STAFF ANALYSIS OF FORWARD-LOOKING ECONOMIC COST PROXY MODELS

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February 19, 1997

SUMMARY

The Commission has undertaken proceedings on Universal Service, interstate access charge reform, and local exchange competition to overhaul current regulations in light of the Telecommunications Act of 1996. In each proceeding the Commission has examined the use of cost proxy models as a regulatory tool to estimate forward-looking economic costs of providing various components of telephone service.

On January 9, 1997, the Commission Staff released a paper intended to stimulate discussion of criteria for the evaluation and use of forward-looking cost proxy models in determining universal service support payments, cost-based access charges, and interconnection and unbundled network element pricing ("Staff Analysis"). The Staff Analysis focused on several forward-looking, economic cost models. The models examined by the Staff include the Cost Proxy Model, the Benchmark Cost Model 2, and the Hatfield Model, version 2.2, release 1. Two new models have been introduced since the issuance of the Staff Analysis. The new models are the Benchmark Cost Proxy Model, which supplants both the Benchmark Cost Model 2 and the Cost Proxy Model (filed January 31, 1997), and Hatfield model version 3, release 1, which supplants the Hatfield model version 2.2, release 1 (filed February 5, 1997).

Set forth herein are the comments of Sprint Corporation on the Staff Analysis and the models set forth above. Sprint shares Staff's belief that proxy models can be valuable tools in developing rules in access reform, interconnection, and universal service. One model with sufficient flexibility could be used in all three situations. While we have not had the opportunity to test Hatfield 3, Sprint is convinced that BCPM is the superior model in building the kinds of networks that need to be developed in Universal Service.

BCPM is much more rigorous in its investment logic; it is much more precise in its treatment of variable conditions (e.g. terrain, soil, density, et al.); it is much more realistic in its approach to the cost of capital; it is much more flexible; and it is much more granular in its approach to units of geography. Sprint submits that the adoption of BCPM in these respects is appropriate and consistent with the guidelines set forth in the Staff Analysis.

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COMMENTS OF SPRINT CORPORATION ON STAFF ANALYSIS OF FORWARD-LOOKING ECONOMIC COST PROXY MODELS

I. INTRODUCTION

The Commission has undertaken proceedings on universal service, interstate access charge reform, and local exchange competition to overhaul current regulations in light of the Telecommunications Act of 1996. In each proceeding the Commission has examined the use of cost proxy models as a regulatory tool to estimate forward-looking economic costs of providing various components of telephone service. On January 9, 1997, the Commission Staff ("Staff") released a paper intended to stimulate discussion of criteria for the evaluation and use of forward-looking cost proxy models in determining universal service support payments, cost-based access charges, and interconnection and unbundled network element pricing ("Staff Analysis").[1] On the same date, the Common Carrier Bureau ("Bureau") issued a Public Notice seeking comment on issues raised in the Staff Analysis, and setting deadlines of February 3, 1997, for initial comments, and February 14, 1997, for replies.[2] The Public Notice indicated that the record gathered in response to the Staff Analysis might at a future date be associated with the official

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[1] The Use of Computer Models for Estimating Forward-Looking Costs, A Staff Analysis, rel. January 9, 1996 ("Staff Analysis").

[2] Commission Staff Releases Analysis of Forward-Looking Economic Cost Proxy Models, Public Notice, DA 97-2 (rel. Jan. 9, 1997) and Erratum, rel. January 10, 1997 ("Public Notice").

record of certain pending rulemakings to which it may be relevant and used to support Commission determinations in those rulemakings.[3]

The Staff Analysis focused on several forward-looking, economic cost models. The models include the Cost Proxy Model ("CPM"), filed jointly by Pacific Telesis Group ("Pac Bell") and INDETEC International in June; the Benchmark Cost Model 2 ("BCM2"), submitted by Sprint Corporation ("Sprint") and US West Communications, Inc. ("US West") in July; and the Hatfield Model, version 2.2, release 1 ("Hatfield 2.2.1"), submitted by AT&T Corp. ("AT&T") and MCI Telecommunications Corporation ("MCI") in May .[4] In late August, The Staff noted it received the Hatfield model, version 2.2, release 2 ("Hatfield 2.2.2"), which is an updated version of Hatfield 2.2.1.[5]

On January 24, 1996, Pac Bell, Sprint, and U S West, filed a Motion for Extension of Time to File Comments in response to the Public Notice in light of the fact that the model sponsors had indicated that the models would be superseded by newer versions. The new models are the Benchmark Cost Proxy Model ("BCPM"), which supplants both the BCM2 model and the CPM model and was filed January 31, 1997, and Hatfield model version 3, release 1 ("Hatfield 3"), which supplants Hatfield 2 and was filed February 5, 1997. Additionally, another model, Dr. Ben Johnson's Telecom Economic Cost Model, was filed in the Universal Service proceeding. By

[3] See Federal-State Joint Board on Universal Service, CC Docket No. 96-45, Access Charge Reform, CC Docket No. 96-262, and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96- 98.

[4] Staff Analysis para. 6.

[5] Id.

Order dated January 31, 1997 the Bureau extended the deadlines for filing initial and reply comments until February 13 and February 20, 1997, respectively.[6]

On February 10, 1997, GTE Service Corporation Filed an Emergency Motion for Further Extension of Time on the grounds that the new models had been made publicly available later than originally expected, thus providing the parties less opportunity to evaluate them. The Bureau extended the deadlines for filing initial and reply comments until February 18 and February 24, 1997, respectively.[7]

Sprint hereby submits its comments in this regard.

II. CRITERIA FOR EVALUATING THE UTILITY OF THE COST MODEL

The Staff Analysis begins with a discussion of the criteria for evaluating an economic cost model. These criteria include: (a) use of a forward-looking costing methodology as a basis for pricing; (b) the ability to measure the cost of a narrowband network and use of the models for multiple objectives; (c) consistency with independent cost evidence and the potential for independent evaluation of model algorithms and input assumptions; and (d) flexibility to vary user input choices. The Bureau seeks comment on these design criteria, and other issues, including whether a proxy model should estimate the cost of a network capable of delivering broadband services as well as traditional narrowband services.

A. Adherence To A Forward-Looking Costing Methodology

Sprint concurs in the Staff's conclusion that in competitive markets firms base their actions on the relationship between market-determined prices and forward-looking economic

[6] Extension Of Time Granted For Parties To Submit Comments In Response To Commission Staff's Analysis Of Cost Proxy Models CCB/CPD No. 97-2, DA 97-239, rel. January 31, 1997.

[7] Extension Of Time Granted For Parties To Submit Comments In Response To Commission Staff's Analysis Of Cost Proxy Models CCB/CPD No. 97-2, DA 97-333, rel. February 12, 1997.

costs.[8] If forward-looking economic costs exceed market prices, new competitors will not enter, and incumbent firms may decide to exit. These voluntary actions by firms produce efficient resource allocation by adjusting price and output until the value to consumers of additional output is just equal to the cost of the resources required to produce it.

As noted above, the Commission has undertaken proceedings on universal service, interstate access charge reform, and local exchange competition to overhaul current regulations in light of the Telecommunications Act of 1996. In each proceeding the Commission has examined the use of cost proxy models as a regulatory tool and explored the application of such models to the particular facet of the regulatory process at issue. In Sprint's view, it is not only desirable but necessary for the decisions in these proceedings to be based on a common fundamental economic concept to insure the introduction of meaningful facilities-based competition into the local exchange market. In the Interconnection Order,[9] the Commission established TELRIC as the fundamental forward-looking long run incremental cost methodology (with an appropriate allowance for joint and common costs) which establishes this common economic basis. Sprint views the Commission's decision in the Interconnection Order as laying the economic foundation for Universal Service support and access reform as well. As the Staff notes, basing prices on embedded costs would fail to establish the critical link between economic production costs and market prices, and would be inconsistent with the goal of efficient competition.

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[8] Staff Analysis para. 9.

[9] Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order released August 8, 1996 (FCC 96-325) (hereafter, "Interconnection Order"), review pending sub nom. Iowa Utilities Board, et al. v. FCC, 8th Cir. No. 96-3321 et al.

B. Ability To Measure The Cost Of A Narrowband Network And Use For Multiple Objectives

The Staff indicates that it is their belief that a model for pricing services and unbundled network elements should, at a minimum, be able to estimate the full stand-alone cost of the minimum set of network elements capable of delivering traditional voice telecommunications service and narrowband data services, at currently acceptable quality levels, to customers of the public switched network and to private line users.[10] In addition, the Staff notes that proxy models may be utilized for multiple regulatory objectives, such as in a prescriptive approach to access reform, determining levels of universal service support in high cost areas, and the pricing of unbundled network elements. The Staff suggests that it is not clear whether a single proxy model, or combination of models, can or should be used to achieve all of these objectives.[11]

Sprint submits that proxy models employed in calculating Universal Service support can be a starting point to determine the pricing of some unbundled network elements, but only those elements associated with the provision of Universal Service. Universal Service proxy models employ nationwide cost factors to calculate the costs of providing Universal Service. Unbundled network element models will differ in two significant respects: (1) company-specific cost factors, not nationwide data, are appropriate for pricing unbundled network elements on a company-specific basis; and (2) the unbundled network elements required for interconnection are greater in number than those required for Universal Service.

Sprint submits that, with the appropriate variation of inputs, the BCPM is indeed flexible enough to be used for the development of cost support information for both nationwide Universal

[10] Staff Analysis para. 10.

[11] Id.

Service and individual company pricing. Company-specific cost factors are not only appropriate but required for statutorily correct pricing of unbundled network elements for interconnection. The incumbent local exchange carrier ("ILEC") is entitled to the opportunity to recover its reasonable and legitimate costs of providing this service. However, Universal Service support does not reflect the cost of the provision of a specified unbundled network element for a specific company, but rather calculates a basis for determining subsidy. A nationwide cost factor is necessary for the Commission to efficiently manage the process of determining nationwide subsidy payments for any LEC, ILEC or CLEC. The nationwide factor allows proxy models to be run independently of detailed study area cost studies by LECs.

It should also be noted that Universal Service cost proxy models do not, and need not encompass all of the unbundled network elements. In the case of local switching, these models develop costs for basic ports which do not include rotary trunks (key and PBX), ISDN and CENTREX. For switch features like Caller ID with Calling Name, the Universal Service models exclude the costs of intelligent network service control point databases that store the calling name information. Also, loop cost models do not calculate the costs of high-capacity digital loops, such as DS-1, DS-3, HDSL and ADSL. Other miscellaneous unbundled elements, such as enhanced 911 (E911), directory listings, operator and directory assistance are not sufficiently identifiable in universal service cost proxy models.

C. Consistency with Independent Cost Evidence and Potential For Independent Evaluation

The Staff suggests that it may be possible to obtain independent estimates of the costs of some unbundled network elements as a check on the validity of model estimates. Sprint agrees that any model needs validation. It is indeed possible and desirable to obtain independent

estimates of the costs of unbundled network elements as a check against the validity of the pricing for these elements developed by forward-looking cost models. The sponsors of BCPM have provided for user input of prices relating to materials and labor (including all discounts). The Commission should test the reasonableness of the default prices used by the model sponsors using independent sources.[12] Prices should be at a national average when testing for Universal Service - related costs and at regional and company levels when testing for costs associated with unbundled network elements and access.

The Staff also questions whether econometric studies could provide any check on the results of a particular model.[13] Sprint submits that econometric studies have little value for testing the validity of forward looking cost results. Econometric studies are based on historical data which are not conducive to the forward-looking models. Such studies, however, could be used to develop price ranges for material and labor which could be used in testing the reasonableness of input data.

The Staff raises another option for the parties to provide engineering studies for a representative sample of Census Block Groups ("CBGs") that would evaluate the networks derived by the models by comparing them to engineering plans used to build actual networks using today's technology.[14] The Staff suggests that this approach would help them determine whether the models accurately estimate the level of facilities necessary to provide service, or whether the derived networks under or over-build facilities. Sprint submits that, although it is

[12] The assumption in this recommendation is that there could be developed a mechanism to select a truly independent firm with the necessary expertise to conduct such an evaluation. A request for proposal sponsored by the Commission might be one approach.

[13] Staff Analysis para. 12.

[14] Id.

possible to compare model-developed networks to existing networks and network plans, that would be a comparison of a forward-looking deployment of technology to facilities that have been built over time and would reflect the specific engineering, budget and growth patterns of particular regions and companies at that historic point in time. A theoretically preferred approach would be to test the reasonableness of the modeled network against an independent engineering study of the cost of construction of new facilities for a sample of CBGs based on the same basic deployment. The independently engineered network would be developed using appropriate physical measurements, including appropriate loop lengths and fill factors.

The Staff also suggests that it may be instructive to compare estimates calculated by the models with data from Automated Record Management Information Systems ("ARMIS").[15] The Staff notes that all of the existing models report levels of forward-looking investment that are significantly lower than embedded levels of investment reported in ARMIS data. In addition, some of the models report significantly lower levels of expense than are reported in ARMIS data.

Sprint suggests that comparisons of unbundled element TELRIC costs to ARMIS investment information have little value. A number of independent variables will drive differences between the two numbers, including changes in technology, increases and decreases in material and labor costs, changes in the service level requirements and service quality standards. Changes in technology, such as the introduction of SONET, can be significant drivers of both investment and maintenance versus historic copper cable and microwave radio facilities. While input prices have fallen in some areas, they have increased in other areas such as the price for labor and copper cable. The level of service required is also changing versus historic levels. The economy today is

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[15] Staff Analysis para. 13.

much more telecommunications intensive and cannot tolerate service disruption. Additionally, the proliferation of personal computers with ever higher bit-rate modems is demanding higher performance of loop plant.

The Staff also notes that the algorithms and judgments made by a proxy model's designer or operator should be clearly identified and explained so they can be independently evaluated by state or federal regulators.[16] The Staff raises the question as to whether models could utilize proprietary information (such as vendor pricing data), which would be made available to third parties in regulatory proceedings under protective order. The Staff notes that although this approach may produce more accurate results, it could be administratively more cumbersome to evaluate.

Sprint submits that use of a proxy cost model requires inputs of both publicly available data and proprietary data. In those situations where accuracy is only slightly impaired, publicly available data should be used. With inputs of many data points, accuracy may not be harmed if it can be demonstrated that the result is statistically valid within acceptable error margins. In one key respect, however, Sprint strongly supports the suggestion that proprietary information must be used -- and that is for switching costs. Although this may raise sensitivity and increase administrative issues, model output in this respect is too sensitive to sacrifice accuracy. Due to the intransigence of the switch vendors in this regard, Sprint suggests the Commission provide an appropriate administrative remedy to require the production of this information. It is critical that switching costs have a high level of accuracy since this is the starting point for a multitude of other factors developed with the model.

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[16] Staff Analysis para. 15.

D. Flexibility

The Staff notes that some states may possess detailed information about important model inputs, such as discount prices offered by switch vendors, that model designers could only estimate.[17] In addition, states may possess detailed information on local conditions, such as zoning restrictions and labor rates, that they may wish to add as inputs to a model. The Staff also believes that cost proxy models should permit states to utilize such information where available. Also, since the models may be used at different levels of aggregation (e.g., state density zones for pricing purposes, as compared to wire centers or CBGs for universal service), the Staff suggests a model should be sufficiently flexible to permit a user to vary model inputs.

To a certain degree, flexibility is desirable in that it enables sensitivity analysis, facilitates policy decisions and increases the value of a model in the future as processes change over time. BCPM offers great flexibility in the variation of inputs. Changes are easy to implement with options clearly defined. From the perspective of detailed regional data, model flexibility is most appropriate in the development of unbundled network element prices to capture the specific costs of the supplier. State commissions may find value in state-specific or regional-specific flexibility in the development of regulations for a state specific universal service mechanism.[18] Although BCPM offers such flexibility, Sprint suggests that state-specific or regional-specific flexibility has no bearing on the funding of Universal Service. The Universal Service subsidy is more appropriately determined using a national benchmark cost.

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[17] Staff Analysis para. 16.

[18] Such state specific regulations must not be inconsistent with the Commission's rules to preserve and advance universal service. 47 U.S.C. Sec. 254(f).

III. MODEL STRUCTURE AND INPUT REQUIREMENTS

The Staff's Analysis also contains a detailed analysis of the structure and input requirements of existing proxy models. With regard to model structure, the paper examines various issues including: (a) the use of existing local exchange carrier wire centers; (b) the geographic unit of analysis used by model proponents in designing their networks; (c) the specification of demand for business and special access lines; and (d) the specification of network elements included in a model and the services those elements are capable of providing. The Staff's Analysis also analyzes the engineering assumptions made by existing models submitted in one or more of the rulemakings listed above in determining levels of forward-looking investment, with particular attention directed to feeder and distribution routes, fill factors, investment in structures, and switching investment. Finally, the Staff's Analysis considers the models' treatment of capital expenses, operating expenses, and joint and common costs.

Sprint will comment on the selected specific topics set forth below.

A. Wireless Technology

The Staff notes that wireless technologies may in the future be capable of providing narrowband telecommunication services at a lower cost than wireline technologies and that they are examining how models should incorporate wireless technologies into their estimates of forward-looking costs.[19] The Staff is currently considering whether there should be a cost-cutover, or threshold cost per loop that would trigger the use of wireless technology instead of wireline. The Staff is not aware, however, of any study that attempts to estimate what this threshold should be.

[19] Staff Analysis para. 21.

The existing models develop costs based on landline facilities. It is possible that wireless technology may now be the least cost alternative in some areas and, as the technology is further developed, it may become the least cost alternative in many remote and sparsely populated areas. At this point, cost data are too limited to include in the model. The BCPM uses a cap of $10,000 of investment as an estimate of the point at which wireless replaces wireline. As soon as fixed wireless technology becomes more widely deployed, reliable cost data should be implemented in the model so that costs may be developed for Universal Service support purposes.

B. Geographic Unit of Analysis

The Staff notes that the BCM2 and Hatfield 2.2.2 models both use, as the basic unit of analysis, the CBG, as defined by the Bureau of the Census. Each CBG contains approximately 400 households, and therefore the number of square miles contained within a CBG varies inversely with population density.[20] The CPM, filed jointly by Pac Bell and INDETEC, by contrast, uses a geographic grid structure. The CPM's geographical unit is 1/100th of a degree of latitude and longitude (approximately 1/4 square mile), which its sponsors characterize as a "grid." This allows the CPM the flexibility to model the cost of various types of serving areas, such as wire centers or political jurisdictions, as well as CBGs. The Staff seeks input as to whether a grid structure may be preferable because it allows households to be matched more accurately with existing wire centers.

Sprint submits that in developing a model for the purpose of determining and distributing support for Universal Service, the more information regarding the location of subscribers the more accurate the model will be. In urban and most suburban areas information at the CBG level exists in sufficient detail for use in the model. In sparsely populated rural areas a CBG may cover

many hundreds of square miles, making it very difficult to develop an efficient model network to serve persons living there and, as a result, developing the correct amount of support becomes problematic.

The best way to address this problem may be to geocode (assign V&H coordinates) every household in a CBG where the population density is below a certain level. This would enable the network to be designed specifically to serve every subscriber at his or her exact location. This may be possible and is something that should be considered in the implementation stage of this process. However, prior to the availability of a geocoded data base, sparsely populated areas can be further segregated into census blocks ("CB"). The sponsors of the BCPM are continuing to refine the model and are testing output at the CB level. The sponsors of the BCPM will continue to work with the geographical and census data available to develop the most accurate household location procedure possible.

C. Specification of Demand

The Staff suggests that an accurate estimate of the cost of serving a CBG or any other serving area depends on a reliable forecast of customer demand patterns within the area, including the number of residential and business lines.[21] Each model relies on census data to determine residential demand. However, because census data do not report the number of business lines, model designers must use indirect methods to estimate business demand. The potential for error in estimating business and residential demand creates certain difficulties.

Both the BCPM and Hatfield 3 rely on census data to size the distribution network and switching capacity. Data for residence households are available at the CB level, and business line

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[20] Staff Analysis para. 22.

[21] Staff Analysis para. 25.

data are available, from public sources, at the state level. Residential and business access lines are available at the wire center level (not the CBG level) from ILEC records. Although this data is not public, it could be easily developed by the Commission through the use of a data request to the ILECs and competitive local exchange carriers (CLECs).

D. Estimating Demand

The Staff suggests that the models should include the total demand for telecommunication services, which, at a minimum, should include the demand for first and second residential lines, business lines, public access lines, and special access lines.[22] The Staff is in the process of evaluating how second residential lines and business lines, as well as broadband loops should be incorporated in a model used to estimate the forward-looking cost of network elements and supported services. The Staff notes, however, that these different types of lines may be provided using shared equipment, and the exclusion of any lines may lead to an overestimation of per-line costs when economies and scale and scope are present in the delivery of telecommunications services. The Staff also notes that all three models rely on current demand patterns to estimate the demand for loops, rather than employing forward-looking estimates of loop demand.[23] Because it is costly to increase a network's capacity or to build plant that will be under-utilized, the Staff believes that the use of current demand, such as that found in ARMIS, rather than a forecast of demand over the service life of the network may lead to significant modeling inaccuracies.

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[22] Staff Analysis para. 28.

[23] Id.

Sprint disagrees. Forecasts can lead to even greater distortions because forecasts are generally performed at levels no lower than the wire center level and significant variation in growth may occur at a much lower level. It is possible to accurately forecast a growth rate of 10% for a wire center and have one CBG within that wire center experience a 20% growth rate while another CBG may experience a 0% growth rate. The model results under this scenario will be distorted. Sprint suggests that since a model is to be used to identify costs associated with providing Universal Service on a line-by-line basis, as long as the network is sized for efficient provision of the services identified to be supported, including all other known services so as to take advantage of scale and scope, the use of forecast data is unnecessary. A more appropriate method would be to run the model on an annual basis with updated estimates of demand.

E. Specification of Network Elements

The Staff concludes that, in general, cost proxy models seek to estimate the forward-looking economic cost of a network used to provide local telephone services.[24] Different models, however, may estimate the cost of networks that are not comprised of exactly the same network components. The Staff believes, therefore, that model sponsors should be required to state precisely the elements included in the network and the services those elements are capable of providing.

Sprint submits that all models should provide, at a minimum, the network elements described by the Commission as those to receive universal service support. In addition, as the models are enhanced to provide costs for unbundled network elements and access, the model sponsors should state what elements are included in the network and what services are provided by those elements.

F. Switching Investment

The Staff notes that the BCM2 assumes that the total cost of switching increases with the number of lines served by a switch and that Hatfield 2.2.2 assumes, by including flat-rated port charges, that a portion of a switch's cost is sensitive to the number of lines served by a switch, but that these costs do not vary according to the number of minutes switched.[25] The models all assume that the proportion of a switch's cost that is not traffic sensitive is constant across all switches in the network. The Staff is not convinced that the models' current treatment of non-traffic sensitive switching costs produces an accurate estimate of the relative proportion of traffic- sensitive and non-traffic-sensitive costs.

Sprint agrees that non-traffic sensitive costs are a significant element of local switching costs and submits that BCPM can be adjusted to account for this. In TELRIC studies for Sprint's New Jersey local switches, approximately one-third of costs are non-traffic sensitive.[26] Sprint's unbundled network element pricing recovers these costs through the port (line) charge and the usage (per minute) charge. The switch port charge recovers the line card, protector, frame and power. The usage charge recovers switch-based software.

Sprint is concerned with the treatment to be afforded costs related to vertical features (custom calling features, CLASS, and advanced intelligent network services). The Commission's pricing rules in the Interconnection Order reach the conclusion that vertical features have small

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[24] Staff Analysis para. 29.

[25] Staff Analysis para. 48.

[26] In the Matter of Access Charge Reform, CC Docket No. 96-262, Comments of Sprint Corporation, January 29, 1997, pp. 19-22.

"traffic sensitive" or variable costs.[27] While the software costs associated with providing the features have a fixed or non-traffic sensitive nature, these costs are incremental only to those ports providing the feature, and should not be spread across all ports and/or usage. In the case of the CLASS service Caller ID with Calling Name, Sprint has invested in adjunct devices to store the names of its subscribers. Sprint also compensates other carriers for the cost of queries to their calling name databases. It is inappropriate to assign the costs of this feature-specific transaction to the generic local switching element. Other features like multi-line hunting and customized routing have a small recurring cost, but require significant nonrecurring costs to install.

G. Capital Expenses

The forward-looking cost of capital is a weighted average of the forward-looking cost of debt and the forward-looking cost of equity. Hatfield 2.2.2 specifies default values of 7.7 percent for the cost of debt, 11.9 percent for the cost of equity, and a 55 percent proportion of equity financing. These assumptions produce a value of 10 % for the weighted average cost of capital. The Staff believes that, when estimating the forward-looking cost of capital, models should rely on market-determined costs for debt and equity as well as debt-equity ratios chosen by firms.[28]

Sprint agrees that the proper forward-looking cost of capital to be used in the proxy cost model is the weighted average of the forward-looking cost of debt and the forward-looking cost of equity. Sprint also agrees with the Commission's Staff that when estimating the forward-looking cost of capital, models should rely on market-determined costs and values, not book values. Most importantly, Sprint believes that the cost of capital used must reflect the additional

[27] Interconnection Order, para 410-414.

[28] Staff Analysis para. 57.