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November 2, 1998

BY HAND DELIVERY

ORIGINAL

Ms. Blanca S. Bayo, Director
Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket No. 980696-TP

Dear Ms. Bayo:

Enclosed for filing in the above docket are the original and fifteen (15) copies of Sprint-Florida, Inc.'s Post-Hearing Statement of Position on Issues and Brief.

We are also submitting the Post-Hearing Statement of Position on Issues and Brief on a 3.5" high-density diskette using Microsoft Word 97 format, Rich Text.

Please acknowledge receipt and filing of the above by stamping the duplicate copy of this letter and returning the same to this writer.

Thank you for your assistance in this matter.

Sincerely,

John P. Fons

Enclosures

cc: All parties of record

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Determination of the Cost of Local Telecommunications Service, pursuant to Section 364.025, Florida Statutes	DOCKET NO. 980696-TP FILED: November 2, 1998

POST-HEARING STATEMENT OF POSITION ON ISSUES AND BRIEF OF SPRINT-FLORIDA, INC.

In accordance with the Prehearing Order, Order No. PSC-98-1303-PHO-TP, Sprint-Florida, Inc. ("Sprint-Florida" or "Sprint") respectfully submits its Post-Hearing Statement of Position on Issues and Brief, stating as follows:

Issue 1: What is the definition of the basic local telecommunications service referred to in Section 364.025(4)(b), Florida Statutes?

Position: The definition of basic local telecommunications service is the definition established by the Federal Communications Commission. Sprint-Florida's definition does not differ significantly from the definition in Section 364.02(2), Florida Statutes.

* * * *

I. Sprint's definition of Basic Local Telecommunications Service is consistent with Florida Law.

As noted above, for purposes of calculating costs in this docket, Sprint-Florida defines basic local telecommunications service as does the FCC in its May 8th Report and Order on Universal Service ("Order"), paragraph 56. In that Order, the services designated to receive support are (paraphrasing): single party service; voice grade access to the public switched network; Dual Tone Multi-frequency signaling or its functional equivalent; access to emergency services; access to operator services; access to interexchange service; access to directory assistance; and toll limitation services for certain customers. (Staihr, Tr. 1465.)

Sprint-Florida's definition does not differ significantly from the definition in Section 364.02(2), Florida Statutes. Sprint has provided information that would calculate the additional costs of adding white pages and access to relay services. These costs are minor and contained in Exh. 60.

II. The Definition of Basic Local Telecommunications Services Offered by the IXCs is Legally and Factually Wrong

As demonstrated above, the proper definition of basic local telecommunications service is contained in Florida Statutes and FCC orders. The IXCs, however, contend that the definition includes "all services that are typically considered basic local services" or "the typical family of services." (Gillan, Tr. 616; Gueppe, Tr. 685-691.) Using this unauthorized definition, the IXCs propose that, for calculating the amount of universal service support that is required, average revenues per residential customer be used. This average revenue benchmark would include all revenues generated by residential customers, including, for example, intraLATA toll, vertical features and access revenues in addition to the basic service rate. The average revenue per customer would then be compared to the forward-looking costs of providing this family of services in each wire center to determine the need for universal service support. This proposal is inconsistent with the requirements of Florida and federal law and is not responsive to any issue for which the Legislature requested a study and report by the FPSC.

Chapter 98-277, Laws of Florida, amended Section 364.025(4) by adding subsection (4)(b), which states:

> To assist the Legislature in establishing a permanent universal service mechanism, the commission, by February 15, 1999, shall determine and report to the President of the Senate and the Speaker of the House of Representatives the total forward-looking cost, based upon the most recent commercially available technology and equipment and generally accepted design and placement principles, of providing basic local telecommunications service on a basis no greater than a wire center basis using a cost proxy model to be selected by the commission after notice and opportunity for hearing.

Section 364.02(2) defines "Basic local telecommunications service" as follows:

> "Basic local telecommunications service" means voice-grade, flat-rate residential, and flat-rate single-line business local exchange services which provide dial tone, local usage necessary to place unlimited calls within a local exchange area, dual tone multifrequency dialing, and access to the following: emergency services such as "911," all locally available interexchange companies, directory assistance, operator services, relay services, and an alphabetical directory listing. For a local exchange telecommunications company, such term shall include any extended area service routes, and extended calling service in existence or ordered by the commission on or before July 1, 1995.

The Legislature, in amending Section 364.025(4) in 1998, used the phrase "basic local telecommunications service" in the manner in which the Legislature defined it in 1995. Vocelle v. Knight Bros. Paper Co., 118 So.2d 664 (Fla. 1st DCA, 1960) (When a statute contains a definition of a word or phrase, that meaning must be ascribed to the word or phrase whenever repeated in the same statute unless a contrary intent clearly appears.) A contrary intent does not clearly appear. In fact, the Legislature could not intend the phrase "basic local telecommunications service" to include toll or vertical features because these services are encompassed within the phrase "non-basic service" which is defined at Section 364.02(8), Florida Statutes, and have long been treated by the Commission as such. Moreover, "network access services" is separately defined at Section 364.163, Florida Statutes, and has never been treated by the Commission as a "basic local telecommunications service."

Looking at the federal law regarding universal service funding, no support can be found for the IXCs' proposal. In the first place, the definition of basic local telecommunications services established by the FCC for universal support purposes is as follows (paraphrasing):

> single party service; voice grade access to the public switched network; Dual Tone Multi-frequency signaling or its functional equivalent; access to emergency services; access to operator services; access to interexchange service; access to directory assistance; and toll limitation service for certain customers.

Just like Florida's definition of "basic local telecommunications service," the FCC's definition does not include the IXCs' "family of services" such as toll, vertical features or access service.

Moreover, the IXCs' proposal to use average revenues from all sources is inconsistent with the Telecommunications Act of 1996. The fundamental goal of the Telecommunications Act of 1996 ('96 Act) is to promote competition in all telecommunications markets, and particularly the local exchange service market. It was early recognized that competition will drive prices towards costs, and that the historic practice of supporting universal service through implicit subsidies built into non-basic services was not sustainable in a competitive market. In order to preserve the policy goal of universal service in a competitive environment, the Act requires that existing implicit subsidies be replaced by an explicit universal service fund. (Sichter, Tr. 2070.) The IXCs' proposal essentially ignores that requirement. At the heart of their approach is the assumption that the existing rates for all services are both economically appropriate and sustainable in a competitive environment. That assumption is simply wrong. The average revenue benchmark that is the foundation of their proposals is the product of monopoly era pricing practices wherein some services have been priced above cost and basic residential services have been priced below cost. (Sichter, Tr. 2070.) The IXCs' approach also continues to keep in place the very implicit subsidies which the '96 Act requires to be made explicit.

Looking only at average revenues masks or ignores what is the core issue: the wide variance in revenues and profitability of individual customers - a variance that is the direct product of the wide variance in profitability of individual services that is produced by the existing rate structure. Under the existing rate structure, the profitability of a customer is a direct function of the mix of services used by that customer. A consumer who uses only basic service would be unprofitable to serve; conversely, heavy users of toll and vertical features "services that are priced substantially above cost" would be very profitable to serve. And the reality is that consumers do, in fact, vary widely in their use of telephone services. While most residential customers don't generate total revenues sufficient to cover the costs of serving them, others are highly profitable to serve. The latter customers, of course, are very attractive to new entrants; and indeed, competition can be expected to drive the prices to this set of customers down towards cost, thereby eroding the source of subsidies for those customers who do not generate enough revenues to cover the cost of serving them. (Sichter, Tr. 2070-71.)

Evidence of the variances in revenue generated by residential customers was provided by Sprint's witness James W. Sichter. He reported an analysis of the revenues generated by a sample of 2,750 of Sprint-Florida's residential customers in the service areas of what was then United of Florida from September 1996. The revenues included in the analysis were local service charges (including the interstate SLC), vertical features, intraLATA toll, and state and interstate access service (originating and terminating). The toll and access revenues were updated using July 1997 intraLATA toll and access rates. The study demonstrates that all residential customers are not the same. While the average local revenues don't vary much over the distribution, average local revenues ($13.13) constitute only 45% of the average total revenues ($29.08) of residential customers. Consumption of vertical features and toll/access, however, varies significantly. The 12% of residential customers in the highest revenue category generate $51.12 monthly in revenues from services other than local service, as compared to only $.70 a month from the 15% of customers in the lowest revenue category. Since it is the toll/access and vertical feature services that are today the source of subsidies to support universal service, the inequities of the current rate structure, and its unsustainability in a competitive market, are made readily apparent by the revenue distribution studied by Sprint-Florida. (Sichter, Tr. 2071-73.)

Consequently, the IXCs' proposal to broaden the definition of "basic local telecommunications service" to include a "family of services" simply prolongs the very interservice cross-subsidies that currently exist. Rather than making explicit the subsidies that currently support universal service, the IXCs, who have consistently sought cost-based access charges, would, by including access costs and revenues in the calculation of basic local telecommunications service, effectively abandon that quest by continuing to place the cost of universal service support on the backs of those consumers who purchase significant quantities of toll services and vertical features.

Issue 2: For purposes of determining the cost of basic local telecommunications service appropriate for establishing a permanent universal service mechanism, what is the appropriate cost proxy model to determine the total forward-looking cost of providing basic local telecommunications service pursuant to Section 364.025(4)(b), Florida Statutes?

__Position:__ *The BCPM Version 3.1, with Florida and Sprint-Florida specific inputs, is the appropriate cost proxy model for determining the total forward-looking cost of providing basic local telecommunications service in Sprint-Florida's service areas.*

* * * *

I. The Commission Should Adopt the Benchmark Cost Proxy Model

Simply stated, the Benchmark Cost Proxy Model[2] (BCPM) provides the most realistic estimation of the cost of basic local telecommunications service. For Sprint-Florida, it does this by using actual line counts, realistically locating customers and finally by building adequate facilities to serve all existing and future customers with advanced services. (Staihr, Tr. 1472-74.) For these reasons, the Commission should adopt the BCPM for use in determining forward-looking costs for Tier 1 LECs in Florida. (Staihr, Tr. 1465) The Florida Legislature has already determined that a cost proxy model is the appropriate costing methodology for use in determining forward-looking costs in the state of Florida. Section 364.025 (4) (b).

[2]Version 3.1 ("BCPM 3.1"), as filed on September 24, 1994.

A. The BCPM calculates the *forward-looking economic cost* of providing basic service.

The BCPM 3.1 is the best costing methodology to use for determining the cost of basic local telecommunications service, because it most accurately reflects the forward-looking costs that would *actually be incurred* by an efficient local provider serving the residential and business customers of this state. (Staihr, Tr. 1465.) The BCPM also accurately estimates the costs of providing individual services in today's market, i.e., the costs that a new entrant would incur and costs that a new entrant would expect to recover through competitive pricing and/or universal service support. Because the BCPM 3.1 is a proxy model, it estimates the costs that would be incurred by any efficient local provider if that provider served the entire market[2]. (Staihr, Tr. 1466-67.)

B. The BCPM is fundamentally better in terms of estimating the location of customers.

Sprint sponsored the testimony of Dr. Brian Staihr who demonstrates that the BCPM's method for estimating the location of customers, and then serving them, with sufficient facilities meets the statutory criteria. (Staihr, Tr. 492-525). Although the commission heard testimony that each model has imperfections, the record is clear, however, that the BCPM is simply more accurate than the HAI model, especially in high cost, rural areas where it matters most to the topic of universal service support. (Staihr, Tr. 1502.)

That the BCPM is more accurate is vitally important to the selection process because true facilities-based competition can only come to all areas of Florida if explicit universal service support is portable and sufficient to compensate potential new providers offering service over their own facilities. For this reason,

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[2] A "market" might be defined as the entire state of Florida, or a particular area currently served by an incumbent local exchange carrier (ILEC), or a portion of the area currently served by the ILEC. The BCPM can and does calculate the costs for any of these "markets". (Staihr, Tr. 1468; 495-6.)

it is essential to get the cost right with regard to what costs a new provider would incur on a going-forward basis. Only then will the new carrier have the proper incentive to enter the rural, high-cost markets. A model that systematically understates the costs of providing basic service in high cost areas will defeat the goal of a competitive marketplace. (Staihr, Tr. 1471-72.)

The BCPM builds an efficient network by maximizing the shared portion of the network route, by ensuring that both rural and urban customers receive the same quality of service through the same technology and by optimizing the layout of the feeder routes to minimize their distance. (Staihr, Tr. 1473.) By accurately identifying customer locations, and building an efficient network to those locations, the BCPM accurately estimates the costs that an efficient provider would incur in the provision of basic service to an entire market. Unlike the HAI model, in the process of building its network, the BCPM does not make unrealistic assumptions or adjustments that can distort the distance and density of customers.

The criteria for judging the quality of a model are: a.) the technology in the model must be least-cost, most-efficient, and reasonable for providing supported services; b.) actual wire center locations must be used; c.) loop technology must not impede the provision of advanced services; d.) wire center line counts should equal actual line counts; and e.) the model's average loop lengths should reflect actual average loop lengths. (Staihr. Tr. 1478.) As demonstrated by Dr. Staihr, the BCPM meets all these criteria by using only forward-looking technology; by optimizing as the network is built; by assuring the capability of providing advanced services; and by using actual wire center locations, actual wire center line counts, and actual loop lengths if available to adjust investment. For instance BCPM insures that access to advanced services are not impeded due to excessive copper cable length. The model limits virtually all copper loops to 12,000 feet.

(Staihr, Tr.1592.) Abundant evidence was presented that is the maximum length that can support ADSL.

More importantly, the BCPM works best where it is needed the most. As Dr. Staihr and Dr. Brian Duffy-Deno testified, using the methodology of allocating customers along road mileage is statistically valid and superior to the HAI's geocoding approach in terms of minimizing distortion. (Staihr, Tr. 1491; Duffy-Deno, Tr. 994-98.) Satellite correlation is very high between the BCPM's road mileage methodology and actual customer locations (i.e. housing units that any eligible provider would be obligated to serve. (Duffy-Deno, Tr. 991-94.) In addition, there is an extremely high correlation between road mileage and where customers are located. Dr. Staihr demonstrated that the correlation between road distribution and population distribution is over 90%. (Staihr, Tr. 507.)

The next most crucial function of the BCPM is to construct facilities to serve the estimated customer locations. Again, the BCPM bests the HAI by a huge margin. Dr. Staihr testified that based on the MST (minimum spanning tree) analysis, the BCPM underbuilds to customer locations in approximately 15% of the grids in the lowest density zones (i.e. where the issue is most relevant). In the comparable clusters, the HAI underbuilds in 85% of the main clusters. (Staihr, Tr. 1501.) Sprint's MST analysis is performed very conservatively. (Staihr, Tr. 1581-1584.) The actual level of BCPM underbuilding would drop significantly if certain cable length and drop length constraints are removed in the model. (Staihr, Tr. 1586-1588.)

C. The BCPM's use of housing units is the most consistent with the obligation to serve and the concept of universal service.

Housing units are the appropriate locations to which a proxy model should build plant. Sprint acknowledges that households, as defined by the census, can be substituted for housing units. However, it is more appropriate that housing units be used for several reasons. First, the housing unit represents all locations that a carrier of last resort has the obligation to serve. What might be a vacant home today might be someone's permanent home tomorrow. Additionally, using households will often mean that second homes will not, in the model, have lines built to them. (Staihr, Tr. 1600-02.) In either case, when making engineering assumptions about the plant requirements, Sprint must assume that all housing units will require service. FPSC Rule 25-4.066(2), F.A.C. requires that the company satisfy service requests for primary service within three working days. Undeniably the least cost method of building plant is by estimating and building to housing units rather than to the number of locations derived from just households with telephone service. The housing unit assumption is also consistent with the FCC criterion that must include all business and residence lines, including multi-line business services, special access, private lines, & multiple residence lines. The BCPM includes all of the above, plus the ability to use actual wire center line counts for single line residence & business, multi-line residence and business, special access, etc. if these counts are available. (Staihr, Tr. 1479.)

D. The BCPM is the only model that is completely open and verifiable.

In selecting an appropriate cost proxy model, the FCC requires that all underlying data, formulae, computations, software must be available to all interested parties for review/comment. Further, data must be verifiable, engineering assumptions reasonable, and outputs plausible. The BCPM meets the selection standards because it is completely open and available to all parties. All preprocessing of data including computer code, algorithms, etc. have been provided to both the Florida Commission staff and the FCC, and are available to anyone through the BCPM website. The model uses public data (Census Bureau data, BLR wire center boundary data) and all data, computations, formulae and algorithms are 100% verifiable. (Staihr, Tr. 1479.) As discussed, *infra,* the HAI model is not open and verifiable especially with respect to the PNR data used in the geocoding. (Staihr, Tr. 1521-23.)

II. The HAI model, Sponsored by AT&T and MCI, is Inherently Deficient and Should Not Be Used to Determine the Cost of Basic Local Telecommunications Service

AT&T and MCI's witness, Mr. Don Wood, contends that the HAI model 5.0a ("HAI model") is "the most accurate and reliable means" of developing cost information. (Wood, Tr. 759.) He further states that a model must do two things: It "must accurately determine customer locations" and it must "connect those customers with the serving central office using network facilities that are efficient . . ." (Wood, Tr. 760-61.) As demonstrated by the evidence presented by Sprint-Florida, the HAI model consistently and significantly underestimates and underbuilds the amount of cable needed to do exactly what Mr. wood states it must, "connect" customers to the network. (Staihr, Tr. 1506.) Thus, contrary to Mr. Wood's assertions, the HAI model is not the most accurate and reliable costing methodology available to the FPSC, but it is a model that is fundamentally and systematically flawed biasing the result to produce lower costs. (Staihr, Tr. 1483.)

There is no question that "customer location" is a key driver of the cost of providing basic local telecommunications service. However, it is not enough for a model to "locate" customers, because a model must also use that location information when building the network and calculating costs. If a model "locates" customers but then fails to use that information, there is no advantage to locating customers. Sprint-Florida's evidence demonstrates how the HAI Model's preprocessing ignores actual customer locations when it constructs a network in rural areas.[7] The result, particularly in rural areas, is an understating of the cable required to serve customers. (Staihr, Tr. 1505-06.)

Contrary to its assertions that the HAI model is the most accurate because it uses geocoded customer location information, geocoded locations are only used in the model's preprocessing to determine which customers will be served together. Once that has been determined, geocoded location information is never again used. That is why the HAI model produces less plant than is actually required to serve customers. The HAI Sponsors have made the unsupported claim that the BCPM method of placing customers in microgrids based on road mileage was flawed, and inferior to the use of geocoded data. (Wood, Tr. 764.) What Mr. Wood does not mention is that in the universal service areas of Florida, 1) the vast majority of the HAI locations are not geocoded and 2) in cases where there is data, the geocoded locations are never used to construct the network anyway.[8] (Staihr, Tr. 1491.)

Sprint-Florida presented additional evidence that the HAI model systematically and significantly underbuilds the distribution network. In fact, using *minimum spanning tree* (MST) distance measurement as a reasonability test in rural areas of Florida the network "built" by the HAI model is a non-functioning network. The MST measures the minimum linear distance required to connect any set of points or customer locations in the most direct way. In its analysis, Sprint-

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[7] Furthermore, the HAI model designs a network to serve households with a phone, rather than a network which serves housing units. By designing a network which only serves households with a telephone, the HAI model foregoes the economics of scale which would come from serving all locations. Additionally, the HAI modeling technique results in not constructing cable to second homes of which there are plenty in Florida. This modeling assumption also ignores the fact that today's housing unit may be tomorrow's household. (Staihr, Tr. 1600-03.)

[8] Because, on average, only seventy (70) percent of customer locations in Florida are geocoded, the HAI model uses a surrogate which locates customers along the census block boundaries which are sometimes rivers, sometimes railroad tracks or sometimes nothing at all. (Staihr, Tr. 1618). In fact, there are some wire centers in Florida where zero (0) percent of the customers are geocoded; and these are generally the very rural wire centers for which universal service support is most important. (Wood, Tr. 821-30.)

Florida compares the length of the network the HAI model builds to the length of the MST. If the total distance of connecting, distribution and drop cable is less than the MST for the points in that cluster, the HAI has underbuilt that cluster, and the network in that cluster is non-functioning. (Staihr, Tr. 1494.) In the overwhelming majority of cases, the HAI model underbuilds the main clusters in rural, low-density areas. In the lowest density zone, the HAI model underbuilds over 90% of the main clusters in Sprint-Florida's serving territory. Because the HAI model build less than the MST while the BCPM builds more, the following statement is appropriate: A key difference between the two models is not merely how each model's preprocessing initially allocates customer locations. Rather, it is in how closely the model comes to using those locations when it builds its network. (Staihr, Tr. 1504.)

It is suggested that even though the HAI model underbuilds plant in some clusters it overbuilds plant in other clusters, but through netting the HAI model builds the right amount of plant. This suggestion is fallacious for two reasons. First, because the HAI clusters actually cross wire center boundaries, part of the distribution cable is in one wire center while part of the distribution cable is in another. In that event, it is impossible to tell whether the model builds too much in one cluster and not enough in another. Secondly, even if through netting the

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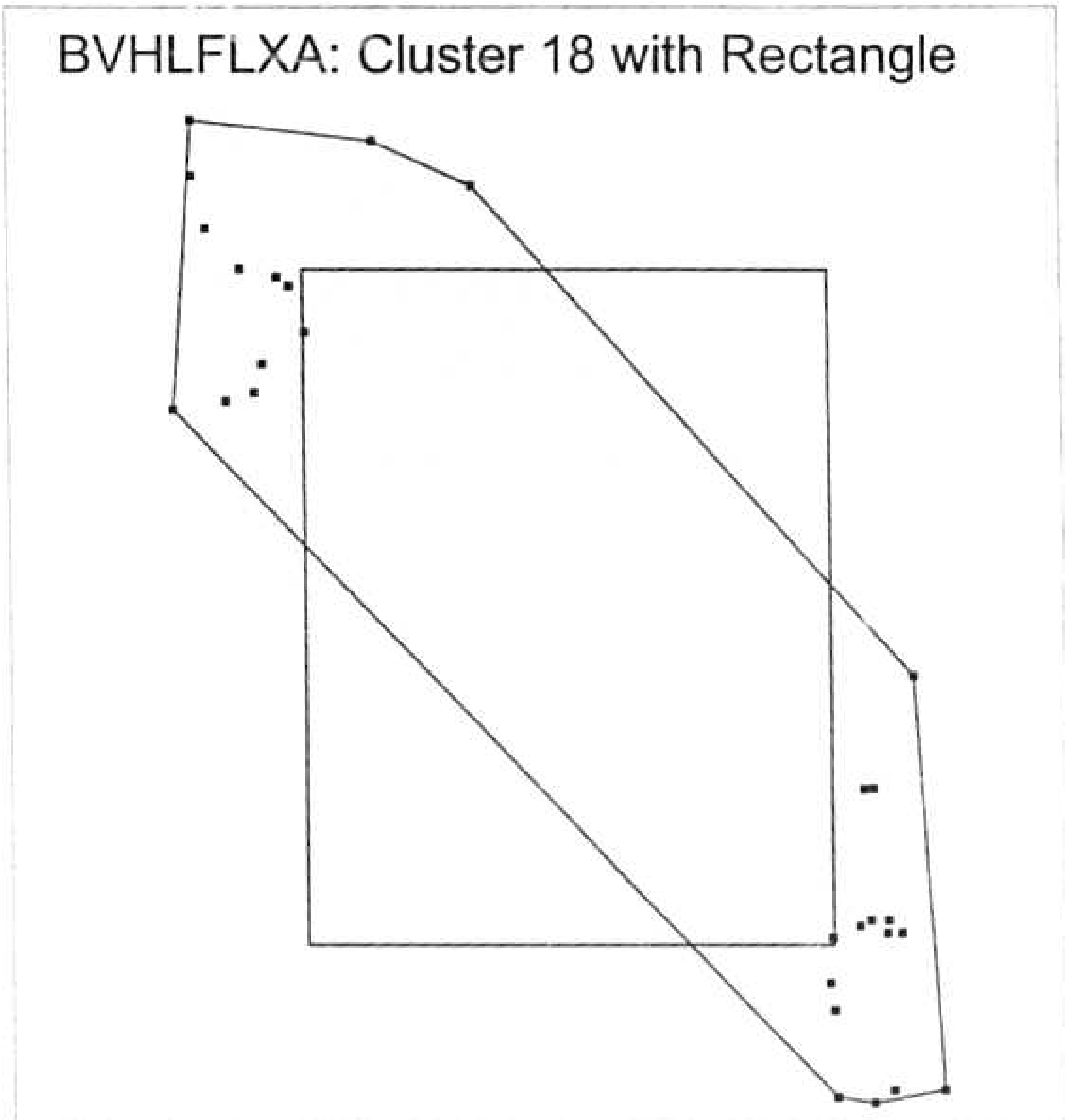
Even using the "Steiner tree," as suggested by the HAI model sponsors, to measure whether a model builds sufficient plant, the HAI model still under builds the necessary network. (Staihr, Tr. 1495-97.) A "Steiner tree" measures distance between a set of points, but it also allows the addition of points or modes in the process of connecting the original points. This can result in an overall shorter distance between points, shorter than the MST. (Staihr, Tr. 1495)

There has been a great deal of confusion as to what types of plant or cable should be included when calculating "what either model builds." For the HAI Model, in the majority of cases the basic unit of analysis, the cluster, represents one serving area and one distribution area. In the BCPM, most ultimate grids represent one carrier serving area that is separated into (up to) four distribution areas. Sometimes the two models have different terms for the cable that is used at various points in the network. Because of this, it is best to consider all plant built within the basic unit (grid/cluster) since all of it may be used for the purposes of connecting customers to each other and to the network. (Staihr, Tr. 1504-05.)

PNR Polygon Cluster and HAI "Equivalent Rectangle"
Beverly Hills Wire Center



Source: Exhibit No. 59

amount of cable footage is correct, in one area there are features, such as soil condition, which affect costs one way and in another area there are different features and different costs. Therefore, the HAI model does not accurately determine the cost of providing enough cable facilities to serve all customers in all of its clusters. (Staihr, Tr. 1607-09.)

Further evidence that the HAI model is deficient in the amount of plant it builds in rural areas was developed during the week before the hearing when AT&T was ordered by this Commission to allow Sprint-Florida, BellSouth and GTE Florida direct access to the PNR and Associates (PNR) data base. On the basis of this eleventh-hour review, further insight was obtained into the flaws in the PNR customer location methodology upon which the HAI's modeling of distribution plant is based. (Staihr, Tr. 1507-08.) Based on their review of the Florida-specific PNR information, Sprint-Florida and BellSouth presented evidence which shows the following:

➢ Examination of PNR polygon clusters and their corresponding HAI rectangles confirms the disparity between the shape and/or orientation of the underlying PNR polygon clusters and the so-called "equivalent" HAI rectangles. The PNR polygon cluster is transformed into a rectangle that may have little resemblance to the underlying PNR polygon cluster. This fact is clearly illustrated in the attached Exhibit No. 59. For this portion of the Beverly Hills wire center, the rectangle which actually enters the HAI model as a cluster contains none of the actual customer locations that supposedly make up this cluster. Furthermore, 1) the actual dispersion of customers is not reflected by the rectangle, 2) the shape of the polygon is not reflected by the rectangle, and 3) the amount of cable needed to connect the furthermost customers to each other could not even fit within the rectangle. Most importantly, this Exhibit No. 59 shows that there are, in fact, no customers located in the very area where the HAI model will place the customers; in the center of the rectangle. (Staihr, Tr. 1520.)

➢ Because the HAI rectangle is used as the basis for modeling distribution plant, distortions between the shape and orientation of the PNR polygon cluster and the HAI rectangle can result in understating the dispersion of customers in the locations identified by HAI via the PNR polygon clusters. This can, in turn, result in a substantial underestimate by the HAI model of the distribution plant required to serve the customers as located by PNR. Given that HAI constructs rectangles upon which distribution plant is modeled that have an area equal to the area of the underlying PNR polygon cluster, there are clearly areas where it appears that distribution plant is overbuilt. Since distribution plant is not fungible, overbuilding in some areas does not compensate in any way for inadequate distribution plant in other areas. Appropriate targeting of universal service funding necessitates properly identifying high-cost areas in need of support, designing a network that can serve each high-cost area without overbuilding or underbuilding. (Staihr, Tr. 1508; 1510.)

➢ The PNR clustering algorithm ignores both geographic barriers such as large bodies of water in constructing clusters of customers and modeling the corresponding distribution plant to serve those customers. (Staihr, Tr. 1508.)

➢ Some of the PNR clusters overlap, suggesting the potential to overbuild distribution plant in some areas, despite understating the dispersion of customers in other areas, and underbuilding in other areas. (Staihr, Tr. 1508.)

➢ Some of the clusters extend beyond the borders of the wire center. This phenomenon occurs because the PNR clustering algorithm forms a convex hull about the original cluster points. (Staihr, Tr. 1508.)

➢ A comparison of the HAI distribution cable and drop lengths to the distribution cable and drop distance required to serve the customers in the locations identified by PNR, taking into account road constraints, indicates that the HAI model grossly underbuilds distribution plant. The extent to which HAI distribution and drop cable distance falls short in this analysis is much greater than that reflected by the MST analysis which simply connects customers as the crow flies. (Staihr, Tr. 1508.)

➤ The limitations of address geocoding are illustrated by depicting the substantial disparity between the address geocoded locations identified by PNR and the actual customer locations obtained via satellite imagery for the Yankeetown wire center. (Staihr, Tr. 1509.)

In addition to the failure of the HAI model to locate customers in the rural areas and the failure of the model to construct sufficient plant to serve customers in the rural areas, the HAI model also has several design shortcomings which exacerbate how the HAI model disadvantages rural customers. For example, the HAI model designs a network based on a maximum copper loop length of 18,000 feet. This design is not forward-looking, is not consistent with standard engineering practice (12,000 feet), and will deny customers with copper loops of that length with access to advanced services. (Laemmli, Tr. 2420.) Forward-looking design standards call for the use of fiber feeder for loop lengths in excess of 12,000 feet. Copper loop lengths in excess of 12,000 feet require the use of load coils which interfere with the provision of most advanced services. (Laemmli, Tr. 2421.) Obviously, then, the only possible basis for this model design assumption is that it serves to artificially reduce the network cost produced by the HAI model and thereby to reduce the amount of universal service support. (Laemmli, Tr. 2425.)

Further, the HAI model designs a network which serves customers in remote areas with copper T1 carrier instead of fiber optic cable and DLCs. The use of copper T1 carrier is not a forward-looking network design practice, while use of fiber optic cable and DLCs is. The total bandwidth which must be shared to serve *all* 24 customers that can be served over a T1 carrier is only 1.544 mb/s, rather than the entire 1.544 mb/s which *each* customer may receive from a network using fiber optics and DLCs. (Laemmli, Tr. 2455.) Use of copper T1 carrier in the HAI model means that rural customers will not be afforded the same quality of service and access to advanced services as is afforded to urban and suburban customers. This HAI model design, then, is not consistent with the requirements of the '96 Act. (Laemmli, Tr. 2453.)

In view of the extensive record in this proceeding which demonstrates the many modeling and preprocessing shortcomings and inaccuracies of the HAI model, that model should not be used as the cost proxy model for determining the cost of providing basic local telecommunications service. Using a model which fails to build a realistic, functioning network, especially in those rural, low-density areas served by Sprint-Florida, will jeopardize the ability of those customers in rural high-cost areas from receiving the proper level of universal service support. Furthermore, without the availability of a sufficient amount of universal service support, new entrants will not seek to serve such customers, thereby denying rural customers the full benefits of competition.

<u>Issue 3:</u> **For purposes of determining the cost of basic local telecommunications service appropriate for establishing a permanent universal service mechanism, should the total forward-looking cost of basic local telecommunications service pursuant to Section 364.025(4)(b), Florida Statutes, be determined by a cost proxy model on a basis smaller than a wire center? If so, on what basis should it be determined?**

<u>Position:</u> *In order to assure that support for high-cost areas be adequately targeted, the cost of basic local telecommunications service should be determined on the basis of the census block group (CBG). However, there may be operational and administrative reasons to use the wire center at this time.*

* * * *

The appropriate geographic unit for the calculation of universal service costs is the Census Block Group.

As a general principle, the geographic unit used for universal service (and unbundled network elements) should be one in which the costs of service within that geographic area are relatively homogeneous. Basing universal service funding on the average costs in a geographic area that encompasses both very low cost and very high cost areas is undesirable for several reasons. First, high cost areas with exactly the same level of costs would not necessarily receive the same level of universal service support, since that support would be calculated based on the average costs of some broader geographic area of which the high cost area is only a part. That is, the support received by any particular high cost area would be primarily a function of the cost characteristics of those other areas included in the same geographic area used for the determination of universal service support. In fact, a truly high cost area might receive no universal service support if the geographic area, as defined for universal service purposes, in which it happens to be located is comprised of low cost as well as high cost areas such that the average cost within that area is below the level needed to qualify for universal service support. (Sichter, Tr. 2081.)

Second, basing both universal service support and unbundled network element prices on highly averaged costs distorts the competitive marketplace. New entry would be deterred in low cost areas to the extent that the averaged unbundled network prices greatly exceeded the actual costs of providing the facilities in those areas. Conversely, averaging can produce artificial arbitrage opportunities. For instance, a facility-based entrant could choose to construct facilities in only lower cost areas—and receive universal service support for doing so—and, to meet its eligible telecommunications carrier obligation, serve high cost customers through resale. (Sichter, Tr. 2081-82.)

Sprint's cost study filed in this proceeding calculates costs at the wire center level. However, in order to analyze the appropriateness of using wire center level costs, Sprint has also looked at costs disaggregated to the Census Block Group (CBG) level. The wire center maps, included as part of Mr. Sichter's testimony in Exhibit No. 71, provide CBG level cost estimates, based on the BCPM costs submitted by Sprint in this proceeding, for each CBG in that wire center. What the data demonstrates is that even within a wire center, there can be significant cost variances. For example, the average cost in the Tallahassee wire center is $28.45, but costs in specific CBGs within that wire center range from a low of $17.99 (37% below the average) to a high of $144 (over five times the average). (Sichter, Tr. 2082.)

However, Sprint does not, at this time, advocate that universal service be based on CBGs. Basing universal service support on CBGs or similar levels of geographic disaggregation would pose formidable, although not insuperable, administrative issues. Sprint recommends, therefore, that universal service support initially be based on wire center average costs. However, Sprint equally believes that the Commission should reevaluate the level of disaggregation in two to three years, to determine whether market circumstances warrant or necessitate basing universal service support on a more disaggregated basis. (Sichter, Tr. 2082-83.)

Issue 4: For purposes of determining the cost of basic local telecommunications service appropriate for establishing a permanent universal service mechanism, for each of the following categories what input values to the cost proxy model identified in Issue 2 are appropriate for each Florida LEC? (a) Depreciation rates; (b) Cost of money; (c) Tax rates; (d) Supporting structures; (e) Structure sharing factors; (f) Fill factors; (g) Manholes; (h) Fiber cable costs; (I) Copper cable costs; (j) Drops; (k) Network interface devises; (l) Outside plant mix; (m) Digital loop carrier costs; (n) Terminal costs; (o) Switching costs and associated variables; (p) Traffic data; (q) Signaling system costs; (r) Transport system costs and associated variables; (s) Expenses; and (t) Other inputs.

Position: *The appropriate input values for each of the aforestated categories are set forth in Exhibit KWD-1 sponsored by Kent W. Dickerson.*

* * * *

I. The Inputs Proposed by Sprint Are "Real World" and Should be Adopted.

As equally important as the cost proxy model to be selected by the Commission to estimate the location and cost to serve customers are the inputs that drive the cost of providing service. Sprint-Florida has presented expert testimony on the appropriate inputs. The significant ones are addressed below. The inputs proposed by Sprint should be utilized in lieu of surrogate or default data that bear little relationship to Sprint's conditions in Florida, statistically or otherwise, and appear to be designed to generate just a low output rather than the realistic least cost, forward-looking cost of providing basic local service. Sprint-Florida's inputs comport with the federal requirements (FCC's May 8, 1997 Order on Universal Service) and the requirements of the Florida Legislature in 364.025(4)(b), Florida Statutes.

Sprint's cost study inputs were developed to produce an appraisal of the probable future costs of providing basic local telecommunications services in the individual Florida geographic areas currently served by Sprint. Since the primary purpose of the cost model is to identify the cost of providing basic local service to a specific geographic area, cost inputs were developed from Sprint's operational experience in Florida wherever possible. When this "company specific" information was not available, industry average cost information developed by the BCPM sponsors was used. This industry average .nformation, "default" inputs, was used only if believed to be consistent with Sprint's experience in providing local telephone service in Florida. (Dickerson, Tr. 2301-02.)

In order to be forward-looking, the inputs reflect the costs that an efficient provider of telecommunications service would most likely experience in providing basic local services in Florida. In order to meet this "Florida-specific" requirement, many of the factors that determine the cost of providing basic service are specific to customer location or service area and the company providing the service. (Dickerson, Tr. 2302.)

The BCPM estimates cost in a two stage process: The model determines the cost of *constructing* the telephone network, and then determines the cost of *operating* it. In constructing the network, the model takes into account natural characteristics of the area served such as topography, geology and geography. When the model places buried telephone cable, it considers the specific soil type that is encountered. When the model places aerial cable, it considers the terrain and slope of the area that is covered. It takes into account the dispersion of actual customer locations and the amount of land area that must be covered in order to reach all customers in the market. These are all geographic factors that are obviously location-specific. In addition, the BCPM can also accommodate company specific inputs which reflect location-specific factors that can affect plant costs e.g. local zoning codes impacting construction techniques or use of aerial plant. (Dickerson, Tr. 2302-03.)

Operating expense data that are directly related to plant investment might certainly vary from location to location because these expenses are often maintenance-related. There may be location-specific factors that affect maintenance costs differently in Florida than, say, in Vermont. For example, average maintenance expenses for aerial plant might be significantly greater in a hurricane-prone state such as Florida, than they would be in a state not known for its tropical storms such as Vermont. Regional wage differences can also create significant differences in operating costs among states. (Dickerson, Tr. 2303.) However, because the primary purpose of the model is to develop deaveraged cost estimates by geographic area, the model should not reflect a standard set of inputs for all Florida companies using BCPM 3.1. If a standard set of inputs were included for all companies, the model's precision in developing cost by location would be diminished. (Dickerson, Tr. 2303.)

The approach used in developing Sprint-Florida's proposed cost inputs provides the best data for estimating the forward looking cost of basic local service within Sprint - Florida's serving area. Sprint-Florida's inputs reflect the realities of providing service within Sprint-Florida's operating territory for the following reasons:

a.) Sprint's inputs reflect the contractor prices currently in effect for 1998 for constructing plant within Sprint's Florida serving area;

b.) Sprint's inputs reflect the actual construction techniques (plow, trench and backfill, cut and restore asphalt, bore cable etc.) utilized in placing plant in Sprint - Florida's serving area for the very recent period of 1997. The same terrain, local building codes, and infrastructure issues (density) encountered in placing these recently installed facilities in Sprint - Florida's serving area can reasonably be expected to continue into the future; and

c.) Sprint's recent experience with actual purchases and installations of telephone plant equipment provides the best information for predicting the forward looking installed costs within Sprint - Florida's serving area. These inputs are based on current vendor prices for material and equipment purchases and current Sprint - Florida specific contract and company labor costs for engineering and installation. (Dickerson, Tr. 2305.)

Clearly the recent factual and objective data provides the best basis for predicting the forward-looking cost of constructing telephone plant in the very same area from which the data was drawn (i.e., Sprint - Florida's serving area). (Dickerson, Tr. 2305-06.)

A. Sprint's depreciation inputs are forward-looking and should be accepted.

Sprint has utilized forward looking economic depreciation lives consistent with the concept of building a network composed of forward looking least-cost technologies. The depreciation lives for the critical network components of Digital Switching, Digital Circuit Equipment and all Cable & Wire Facilities are based on a study by Technology Futures, Inc. (TFI). The TFI depreciation inputs meet the Florida and federal requirements of being consistent with a network composed of forward-looking least cost technologies. (Dickerson, Tr. 2306.) Sprint's depreciation rates were also reviewed by Jerome Weinert who has provided expert testimony on the subject of depreciation. As indicated by Mr. Dickerson, Mr. Weinert's testimony filed earlier this year in Nevada expressly supports the TFI rates utilized by Sprint. (Exh. 82. , p. 50; Exh. 82 (L.F. Dep. Exh. 4.))

B. Sprint's cost of capital inputs are theoretically sound and should be accepted.

In this proceeding, the Commission has the task of determining a forward-looking cost of capital, including equity and debt. Mr. Dickerson has utilized an overall cost of capital of 11.25%. (Dickerson, Tr. 2306.) This figure has been endorsed by the FCC for the Federal Universal Service purposes. On this basis alone, the Commission has the discretion to utilize 11.25% in this proceeding.

More importantly, Professor Randall Billingsley provides expert testimony supporting the use of an 11.25% capital cost. Dr. Billingsley uses three different approaches in determining the forward-looking cost of capital for Sprint.[7] The results of the discounted cash flow (DCF), capital asset pricing model (CAPM) and risk premium analyses all confirm a return on equity (ROE) in the range of 14.3% to 14.5% for Sprint. (Billingsley, Tr.398). Professor Billingsley's analysis is presented consistent with well-accepted regulatory and economic standards in cost of capital analysis.

For the DCF approach, Dr. Billingsley applied the model to a group of firms comparable in risk to Sprint-Florida. This process yielded a market determined cost of equity capital for Sprint ranging from 14.43% to 14.53%. The CAPM was applied to the publicly traded firms comparable in risk to the Sprint. This generated a cost of equity of between 14.30% and 14.50%. Finally the risk premium analysis demonstrated that the expected return on the overall equity market as measured by the S&P 500 is between 13.79% and 14.86%. Each of the figures is based on the most recent information submitted in Dr. Billingsley's rebuttal testimony. (Billingsley, Tr. 368; 398.)

Dr. Billingsley provides the same analysis for BellSouth.

The forward-looking cost of debt presented by Dr. Billingsley is 7.02%. This input is derived using current forward-looking market data. This estimate was produced by adding the current yield to maturity on 30-year U.S. Treasury bonds to the average difference between the yields on Treasury bonds and the yields on benchmark bonds issued by firms with similar risk characteristics to Sprint. Excluding the (material) effect of flotation costs, the estimated forward-looking cost of debt for Sprint is 7.00%. (Billingsley, Tr. 387-8.)

Finally, Dr. Billingsley provides a very sound test of the reasonableness of the 11.25% FCC-approved capital cost, based on three different capital structures. If the FCC cost of 11.25% is applied to the Sprint Florida capital structure with the embedded, and then forward-looking, debt costs, the implied cost of equity for Sprint would be 13.99% and 14.12%, respectively. Each, of course, is lower than the independently determined cost of equity of 14.3% - 14.53%. (Billingsley, Tr. 399.) Finally, if the more appropriate forward looking capital structure is used with the forward-looking equity and debt cost, the resulting cost of capital would be 13.10% -13.29% for Sprint. (Billingsley, Tr. 399.) This confirms the appropriateness of the FCC's 11.25% cost of capital.

C. Sprint's Supporting Structures inputs should be accepted.

Sprint has interpreted Issue 4d, "supporting structures," to refer to those inputs associated with the installation costs for placing conduit, the cost of creating trenches for buried cable, and the installation cost for poles. (Dickerson, Tr. 2306.)

As noted by Sprint witness Laemmli, the installation of structures costs (including sharing as-discussed below) are one of the largest costs of building the network. (Laemmli, Tr. 2426.) It is vital that the Commission select the correct inputs, based on achievable costs. HAI's fantasy costs levels, achievable only on paper, cannot provide a sustainable realistic level of universal service support that will facilitate true competition.

The BCPM inputs for these structure functions were based on the specific conditions encountered in the Sprint-Florida's service area. Costs for buried and underground structures were developed based on the contractor prices currently in effect for 1998 within Sprint's Florida serving area. The construction activity percentages, also contained in the structure tables, were based upon an analysis of the total 1997 actual contractor jobs for construction of feeder and distribution routes within Sprint's Florida serving area. The use of current 1997 and 1998 data, barring any known reason to change, is clearly the best predictor of the future construction costs in the very same geographic market from which the data was gathered. (Dickerson, Tr. 2307.)

D. Sprint's Structure Sharing Percentages are the only realistic inputs presented.

Significant testimony was generated on the structure sharing issue. Sprint submitted the testimony of both Kent Dickerson and Carl Laemmli on this issue. Mr. Dickerson, a CPA, has more than seventeen years experience in accounting and costing, and Mr. Laemmli has twenty-two years experience in engineering within Sprint (including Sprint Corporation's CLEC operations). Together, these witnesses present evidence that the structure sharing inputs are based on reasonable, practical, real-life sharing opportunities.

The inputs submitted by Mr. Dickerson are the only inputs that are based on these real-world opportunities for sharing. Exhibit 81 contains the real world structure sharing factor inputs. For example, the percent assigned to telephone is set at 30 percent for aerial feeder to reflect existing and expected pole sharing and pole attachment agreements. (Dickerson, Tr. 2307) For buried and underground (conduit and manhole) feeder structures is set at 95 percent for most grids to reflect the fact that sharing with other entities, such as power companies and cable companies, is limited. (Dickerson, Tr. 2307.) In contrast, because the cost varies less and there are significant maintenance savings, Sprint finds burying cable to be the far more economical alternative. (Dickerson, Tr. 2327.)

For buried facilities, Sprint is further constrained in structure sharing with electric power facilities by safety concerns and electric utilities' understandable lack of incentive to allow random lay in light of safety and liability concerns. Because random laying of cables is not allowed by any electric companies in Florida, the opportunities for sharing are not available in Florida to Sprint (or any other potential CLEC). (Laemmli, Tr. 2436-38.) In sum, these inputs are based on the work coordination, safety, and available space considerations which make significant sharing of buried and underground construction costs unlikely.[*]

E. The Sprint Fill Factors are the only real-world inputs.

Sprint's cost study calculates cable fill factor inputs separately for feeder and distribution cables. Feeder routes, as the name implies, feed several distribution routes. Feeder routes normally are constructed so that capacity can be added at a relatively lower cost at some future date. Sprint calculated actual feeder fill based upon working pairs (cable pairs in service) divided by total pairs available as tracked in the Customer Loop Assignment System, Sprint's internal system for maintaining cable pair inventory. This data reflects a real world balance between inventory carrying costs (non-working cable pairs) against the cost of construction for adding additional cable pairs at a later date. These same economics are expected to continue into the future, thus these cable fill input

[*] In sum, Sprint's structure sharing inputs reflect these realities. Notably, FCTA witness William Barta, testified that it is "doubtful" that the structure sharing percentages offered up by the HAI supporters "will materialize immediately or even in the near future." (Barta, Tr. 30) This only confirms that the Sprint inputs are grounded in reality and reflect actual operating conditions.

factors were used to develop the Florida specific cost results. (Dickerson, Tr. 2308.)

Distribution cable contrasts with feeder cable in that it serves individual customer locations. The Company must anticipate individual customer's line demand in order to provide service when requested and to avoid costly construction to add cable pairs at a later date. The distribution cable sizing factor input of 100% works in concert with the related model input assumption of two pairs per household to achieve a reasonable overall distribution cable fill. Generally these model inputs result in distribution cable fills ranging from approximately 40% to 50%. (Dickerson, Tr. 2308-09.)

Sprint's fill factor inputs for distribution cable are driven by customer demand for second lines and the least cost, sound engineering practices of installing the right size cable to reflect the demand of both first and second lines. The experienced demand from second lines has been between 15-20%. (Dickerson, Tr. 2333.)

At hearing, Mr. Dickerson adjusted the pre-filed fill factors for copper feeder cable by 10% to recognize that available cable sizes affect the resulting fill factors. (Dickerson, Tr. 2298.) Sprint's fill factors are the result of the only prudent method of provisioning the network in the present and future. The alternative to taking advantage of the open trench at the time of new development construction and placing sufficient cable pair at that time, is to initially build for only single lines and then go back and disrupt yards, sidewalks and streets to add additional lines. As noted by Mr. Dickerson, this would be an "absolute disaster."(Dickerson, Tr. 2341.) Clearly, the Sprint fill factor inputs are the only inputs that the make sense in this case.

F. The cost inputs for the feeder/distribution cable interface devices and drop cable, terminals, and network interface are appropriate.

The cost inputs are included in the Model's loop cost input tables and were developed based on Sprint's actual current vendor material prices and specific estimates for installation. (Dickerson, Tr. 2309.) The cable plant mix inputs are developed separately for copper feeder and distribution and fiber feeder. The percentages of cable facilities placed in either buried, underground or aerial locations were based on an analysis of Sprint's facilities in Florida adjusted to reflect a forward-looking trend for greater use of buried copper cable and underground fiber cable. (Dickerson, Tr. 2309-10.)

G. Digital loop carrier (DLC) systems inputs are properly determined.

The costs for digital loop carrier systems (DLC) are based on Sprint's current vendor costs and actual installation costs within its Florida serving area. The DLC model costs reflect Sprint's use of forward looking Next Generation Digital Loop Carrier Systems (NGDLCs) which can support a wide range of services from a single device. Sprint's NGDLC model configuration includes costs not only to support the level of basic service specified by the FCC, but has the flexibility to support additional services with incremental investment additions which may be required to meet individual demands for advanced services. The BCPM inputs reflect the appropriate levels of investment for the corresponding line demand and resulting modeled DLC system size. (Dickerson, Tr. 2310.)

As noted previously, the costs for these DLC systems are based on actual Sprint prices and reflect reality, unlike the artificial HAI amounts that approximate one-third of the prices available to Sprint. As noted by Mr. Dickerson, the prices for the DLC's are what they are. (Dickerson, Tr. 2336; 2362; 2378.) Pointing out that Sprint is price-capped, Mr. Dickerson emphasized that the company would be purchasing DLC's at the prices suggested by HAI if they were available to Sprint.

In some cases Sprint can achieve better pricing on the smaller DLCs than a larger company. (Dickerson, Tr. 2391.) All of this proves the Sprint costs are reality based and should be used.

H. Sprint's inputs necessary to develop central office switching equipment costs should be adopted.

Sprint's switching input data, which is preprocessed using the Bellcore Switching Cost Information System ("SCIS") and is combined with the BCPM switching module, reflects the actual and current contractual arrangements between Sprint and the switch vendor. (Dickerson, Tr. 2329-46.) These Sprint-specific purchase arrangements include the most current vendor discounts ensuring that actual price levels are reflected. In fact, Sprint's BCPM forward-looking switch investments are 53 percent below Sprint's book costs for digital switching equipment. (Dickerson, Tr. 2328-29.) Thus, Sprint's BCPM results provide reasonable, forward-looking estimates of basic local service switch costs which are reflective of real-world contracts, transactions, traffic patterns and costs. (Dickerson, Tr. 2329.)

I. Sprint's expense inputs are forward looking, realistic and reasonable.

Operating expenses are included in the model on a per line basis for administrative and retailing expenses not associated with specific network facilities. Operating expenses associated with network facilities were included as a percentage of investment in network facilities. Both of these estimates were derived from the actual operating expenses Sprint experienced in Florida during 1997. These operating expense ratios, when applied against the BCPM forward looking investment levels, provide a reasonable estimate of the forward looking expenses associated with basic local service. (Dickerson, Tr. 2314.)

Sprint-Florida's witness, Mr. Dickerson, testified that the operating expense inputs submitted by Sprint are obviously forward-looking when compared to the most recent historical information[9]. Exhibit 81 demonstrates that the expenses generated by Mr. Dickerson's fact-based approach are 37% lower than the expense levels reflected in the 1997 ARMIS filing. (Dickerson, Tr. 2338.) The expenses generated by the vast majority of Sprint's services (residential and business) included in the BCPM constitute the overwhelming proportion of the total company ARMIS-reported expenses. The bottom line is that the expense levels resulting from the real-life cost study presented by Mr. Dickerson are forward-looking by virtue of the fact that they would reduce expenses by approximately 37%. Any reduction in the percentage by virtue of restating the ARMIS data to include basic service-related expenses would logically have little impact on the 37% reduction from current expense levels. (Dickerson, Tr. 2375-76.)

The Commission should also take note that as a price-capped LEC, Sprint has a tremendous incentive to minimize costs. (Dickerson, Tr. 2379.) The implication by HAI proponents such as AT&T witness Lerma that LEC expense levels are excessive is not made with any comparable future or existing competitor in mind.

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[9] Dr. Staihr's testimony confirms this. Current operating expense data can be the best indicator we have of future expense levels. This is because operating expense data captures current experienced costs in performing a function. Sprint incurs expenses in maintaining digital switches and fiber transmission facilities. There is every reason to believe that these expense levels can reasonably be used as an approximation of the expenses we will incur (or anyone serving our market would incur) in the near-term for those same activities. The best basis for determining the forward-looking costs of any company serving the Sopchoppy area is to look at the maintenance expenses of the company that actually does serve Sopchoppy. Contained in that company's costs are the effects of the conditions under which any company would be required to operate if it served Sopchoppy. That is not to imply that adjustments to expense levels might not be necessary. However, it is clearly better to use existing data, adjusted for known changes, rather than rely on pure speculation. (Staihr, Tr. 1477)

II. The HAI Model Input Values Proposed By The IXCs Are Inappropriate

Except in a few instances, the input values proposed by the IXCs for use with the HAI model are national default values. The HAI's sponsors AT&T and MCI, through their witnesses James Wells and Don Wood, assert that the input values proposed for use in the HAI model are forward-looking and represent the least-cost factors for determining the cost of providing basic local exchange telecommunications service. (Wells, Tr. 2477, 2582; Wood, Tr. 777.) Contrary to their assertion, the HAI input values are neither "real world" nor do they reflect Florida-specific cost factors. Indeed, the HAI input values are national default values which ignore state-specific values. Moreover, the HAI input values ignore current cost information which best reflects "real-world" cost information.[10] (Dickerson, Tr. 2360-61.)

There are several reasons why the HAI national default inputs are not the best available information for predicting the cost of constructing outside plant within Florida. First, the inputs are the same national inputs promoted by the AT&T and MCI in every state and are not specific to Florida, much less to Sprint's serving areas within Florida. As these inputs are national in scale and are promoted for use in all fifty states, the limited data points equate to a range of 58% to 84% probability that a given state is not even represented in the sample. This assumes a best case scenario that each data point is a unique state, which may not be the case. (Dickerson, Tr. 2320-21.)

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[10] Economic theory does not preclude the consideration of historic or current costs in a forward looking economic cost study. Whether or not historic or current costs are a good approximation of forward looking costs is an empirical issue. To argue otherwise (i.e., to exclude any consideration of current costs in a forward looking study) leads to the absurd conclusion that available empirical data should not be given any weight in a forward looking cost study. This would preclude not only use of existing data, but all forecasts based on historic data; in essence reducing forward looking cost studies to pure guesswork. If the inputs selected are to have real world application, as well as to allow an acceptable level of verification and objectivity, an approach that uses current actual information is the only reasonable alternative. (Dickerson, Tr. 2319-20.)

Second, the HAI national default inputs are based upon the unexplained "best estimate" made by a group of so-called outside plant engineers with experience limited mainly to large Bell Operating Companies in the New York/New England area. These "best estimates" were subsequently attempted to be verified in a variety of fashions, including seeking historical and current vendor, contractor and manufacturer quotes for materials and services.[11] Even a cursory review of the so-called "Fassett Documents" (Exhibit No. 87) upon which Exhibit No. 85 is allegedly developed, shows that the vendor quotes and prices – where the location of the work proposed to be done is discernable – are all from western states; such as Colorado, Montana, Idaho, etc., but none are from Florida. Thus, as the record amply demonstrates, these so-called verification efforts simply underscore the fact that the HAI input values are not only biased to the low side, they simply do not reflect real-world, Florida-specific experience.

There are, in fact, a number of HAI model input values which are inappropriate for reasons unique to the inputs themselves. Some of these input values have a significant impact on the outcome of the HAI modeling process and result in a cost of providing basic local telecommunications service which is woefully inadequate for universal service support purposes.[12] The following is a discussion of why the HAI values for these very strategic inputs are appropriate.

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[11] While the HAI model advocates consistently condemn the ILECs for allegedly using current or historical information to forecast the cost of providing basic local telecommunications service, the HAI model uses current and historical vendor and contractor costs to predict future costs. Although inferior to Sprint-Florida's approach, the input development, in fact, endorses the Sprint-Florida approach. (Dickerson, Tr. 2323.)

[12] In addition to the use of input values which are decidedly biased towards understating costs, the HAI model in this proceeding allegedly includes costs which are not related to the cost of providing basic local telecommunications service as defined by Florida and federal law. These costs include the costs of toll, vertical features and access services.

A. The HAI Depreciation Input Values Are Not Forward-Looking

The HAI model uses depreciation input values reported by Michael Majoros, Jr. These depreciation input values rely upon depreciation rates established by the FCC in 1995. (Majoros, Tr. 72.) The HAI depreciation input values for Sprint-Florida are totally inappropriate. First, reliance upon FCC-established depreciation rates for Sprint-Florida is unacceptable because the FCC does not set Sprint-Florida's depreciation rates. Without so much as acknowledging this fact and without any explanation as to why it is appropriate for Sprint-Florida, Mr. Majoros recommends using the lower end of the FCC range of depreciation rates. (Majoros, Tr. 72.)

Additionally, Mr. Majoros, whose recommendations have been largely rejected by the Commission in the past, offers little more than anecdotal indirect criticism of the TFI rates generally (Majoros, Tr. 51). He admits that he has done no Sprint-Florida specific study or analysis (Exh.15, p. 60). Apart from recommending the lower end (shorter lives) of the FCC rates, Mr. Majoros has no affirmative evidence to present to the Commission as to why the TFI forward-looking depreciation rates should not be used. Notably, BellSouth witness Cunningham cites a February 1998 indication from the FCC that the depreciation rates may be outdated and a more forward-looking revision (i.e., repeal) may be needed. (Cunningham, Tr. 85-86.)

Finally, even if the FCC-prescribed depreciation rates were otherwise applicable to Sprint-Florida, they should not be used today because they are simply outdated; the FCC depreciation rates do not reflect the current state of technological advance and do not reflect the impact of competition on opening all telecommunications markets to competition. Consequently, the FCC-prescribed depreciation rates are not forward-looking and do not reflect real-world realities. These input values were chosen by the HAI sponsors not because they are convenient or accurate - the last FPSC-prescribed depreciation rates would fit that requirement better - but rather because they are the lowest depreciation rates that the HAI model sponsors could find for Sprint-Florida. This is just further evidence that the HAI model sponsors have biased the process to produce the lowest costs they can. Again, this is further evidence that the HAI model input values are neither objective nor forward-looking.

B. The HAI Cost of Capital Input Value is Totally Flawed and Biased

The HAI model relies upon a cost of capital estimate for Sprint-Florida to be in the range of only 7.97 percent to 9.12 percent, with a best point estimate of 8.55 percent. (Hirshleifer, Tr. 194-95.) This cost of capital estimate is contrasted with Sprint-Florida's cost of capital estimate of 11.25 percent as used in the BCPM. The HAI model cost of capital input is flawed and biased as demonstrated in the evidence presented by Sprint-Florida.

The HAI model sponsors rely upon the testimony of Mr. John I. Hirshleifer to develop the HAI cost of capital estimate. Sprint-Florida's evidence was presented by Dr. Randall S. Billingsley. Dr. Billingsley demonstrates that Mr. Hirshleifer significantly underestimates the capital costs of Sprint-Florida and, consequently, the HAI model cost estimate is biased due to its reliance on Mr. Hirshleifer's incorrect cost of capital estimates.

As Sprint-Florida's evidence demonstrates, Mr. Hirshleifer's cost of capital estimate is incorrect for a variety of reasons, including errors and inconsistencies in his discounted cash flow (DCF) and capital asset pricing model (CAPM) analysis of Sprint-Florida's cost of equity capital, his cost of debt estimation, his recommended capital structure, and his misunderstanding of the nature and significance of the riskiness of investing in the telecommunications industry. (Billingsley, Tr. 396-97.) Mr. Hirshleifer's errors in estimating the costs of equity for Sprint-Florida using the DCF approach include: (1) use of a highly subjective three-stage model that is not representative of the investor's perspective; (2) use of growth rate forecasts that do not reflect consensus investment community expectation; (3) inappropriate and unsupported reliance on BellSouth, the other regional Bell holding companies (RBHCs), and selected independent telephone companies as comparable in risk to Sprint-Florida; (4) failure to adjust for flotation costs; and (5) failure to use the appropriate form of the DCF model that recognizes the quarterly payment of dividends (Billingsley, Tr. 397.)

Mr. Hirshleifer's CAPM errors in calculating the costs of equity for Sprint-Florida include: (1) significant underestimation of the equity risk premium in part due to the use of his flawed three-stage model, and (2) arbitrary exclusion of all members of the Standard and Poor's Composite 500 Index (S&P 500) from capital cost analysis that do not have a dividend yield of at least 2%. These errors explain why his CAPM estimates of the costs of equity for Sprint-Florida are so seriously underestimated. (Billingsley, Tr. 397.)

Mr. Hirshleifer's cost of debt analyses are flawed by his reliance on dated market information from December 1997. He also incorrectly includes debt in his analyses that was not issued to finance long-term telephone network assets and that was issued by the parent holding company of Sprint-Florida. Moreover, Mr. Hirshleifer places too much reliance on book values in determining his recommended capital structure. Finally, Mr. Hirshleifer's views on the risks that are relevant to assessing capital costs in the telecommunications industry are confused and inconsistent. In the same vein, his argument that the business of leasing network elements is of relatively low risk is unsupported. (Billingsley, Tr. 397-98.)

C. The HAI Structure Sharing Input Values Have No Foundation in Reality

Of all the input values proposed by the HAI model sponsors, the proposed structure sharing input value is the most biased and unreal of the many "low ball" input values used by the HAI model. The HAI model assumes that up to two-thirds of the cost of the support structures, i.e., poles, trenches and conduit, would be shared anyway. For the three largest ILECs in Florida, this would result in over $650 million of outside plant investment simply disappearing. (Wells, Tr. 2617-19.)

The rationale offered by the HAI sponsors for such an outrageous result is that their proposed structure sharing is what an efficient ILEC would have to do in a competitive environment. (Wells, Tr. 2619-20.) Yet, AT&T and MCI provide no empirical evidence to support the HAI structure inputs, but instead rely upon opinion. Additionally, the HAI sponsors have conceded that their structure sharing proposal is aggressive (Wells, Tr. 2625) and that no incumbent local exchange company has been able to achieve the proposed level of structure sharing. (Laemmli, Tr. 2431.) In order to accept the HAI structure sharing rationale, one must be willing to believe that there are one or two other utilities (e.g., power, cable, water, gas and sewer) with a need to build a network at the same time and in the same place, for every single inch of Sprint-Florida's network. For example, for every single inch of plant in the network, if telephone is aerial, power and/or cable will be aerial. For every inch of plant in the network, if telephone is buried, power, and/or cable, or water or gas will be buried.[11] For

[11] There are also serious safety and maintenance concerns in placing telephone and electric power facilities in the same trench. These safety and maintenance concerns result in greater trenching cost (wider, deeper and with significant separation) and maintenance expense (e.g., digging up cables and restoration concerns) which creates considerable disincentives for electric power companies to collocate their cables with telephone plant. (Laemmli, Tr. 2442-43.)

every foot of telephone feeder conduit, power or the other utilities will abandon their existing facilities and choose to bury cable. (Laemmli, Tr. 2430.)

The reality of the situation is this; the economics of constructing telephone networks and other utilities are different. It is, for example, far more expensive for a power company to bury a cable than it is for them to place aerial wire. This is because of the far more expensive buried conductors, deeper trench required, and more expensive transformers, etc. that must be used. In contrast, because the cost varies less and there are significant maintenance savings, Sprint-Florida finds burying cable to be the far more economical alternative. Each provider is going to make network decisions that are in its own economic interests. The net result is that Florida Power Corporation is 81% aerial while Sprint-Florida is 78% buried. Sprint-Florida is 17% underground and Florida Power Corporation has no underground facilities. Structure sharing does not overcome the economics driving this mix and it is not expected to change significantly in the future. (Laemmli, Tr. 2429.)

D. The HAI Fill Factor Input Values Are Grossly Inflated

The HAI model uses national default cable sizing factors which Sprint-Florida's evidence demonstrates are not reflective of a functioning real world telecommunications network. Basic business reality is ignored in the unrealistically high levels of distribution and feeder cable fill factors sponsored by the HAI model sponsors. For example, the HAI national default inputs fail to recognize that because of the way in which networks are built, fill factors within actual working networks are reflective of some cables that are completely full and other new cables that are partially full. At any given point in time, the unutilized cable pairs provide the inventory necessary to meet customer demand for new service within three working days and to resolve 95% of trouble reports within 24 hours. Use of HAI model default inputs would result in a local network that would not provide the necessary cable pair inventory which enables Sprint-Florida to meet the FPSC-imposed service standards. (Dickerson, Tr. 2325.)

In a related input value decision, the HAI model sponsors have determined that the number of loop pairs to each household should reflect an alleged historical second line penetration level of 15 percent. This assumption takes place outside of the HAI model itself and in the preprocessing done by PNR when it determines the number of lines to be placed in a cluster. (Wood, Tr. 1850.) As the record indicates, this is not a forward-looking assumption. Because of the continuing growth in second-line penetration levels, two lines to each household is a forward-looking assumption. (Dickerson, Tr. 2388-89.) Remarkably, the HAI model sponsors' witness Mr. Wells concedes that installing two lines to each household is "a good business practice but is not appropriate for a cost proxy model." (Wells, Tr. 2680.)

E. The HAI Switching Costs Input Values Have No Factual Basis

The HAI model in this proceeding develops switching investment using a melded cost of host, remote and stand-alone switches on a wire center basis and with per-line costs using a series of four cost points on a cost curve. (Wood, Tr. 843-44.) The data supporting these points comes from some published and some proprietary, unverifiable switch vendor information. The resulting switch cost per line is significantly below the switch investment developed by Sprint-Florida using its own contractual discounted vendor switch prices. In fact, the HAI switch investment results for Sprint-Florida are only approximately one-half of the forward-looking BCPM results using Sprint-Florida-specific inputs. These BCPM results are already 53 percent below Sprint-Florida's book cost for digital switching equipment. (Dickerson, Tr. 2328-29.)

Clearly, the HAI model switch investment results are inappropriate. Because the HAI national default switch curve is based on a National Business

Information (NBI) study which focuses principally on the Regional Bell Operating Companies and (RBOCs) and GTE, it is not at all reflective of switching costs for an independent telephone company operation the size of Sprint's local telephone division. (Dickerson, Tr. 2329.) To the extent the NBI study results include switch purchases by RBOCs many times larger than Sprint, they cannot reasonably be applied to Sprint-Florida.

F. The HAI Expenses Input Values Defy Reality

The HAI model includes numerous alleged "forward-looking adjustments" to the 1996 ARMIS expense data. These national default expense adjustments and assumptions are pure speculation and do not result in reasonable estimates for forward-looking expenses. Many of the HAI national default expense assumptions and inputs result in unreasonably low estimates for these necessary expenses. A simple comparison of the HAI results to Sprint-Florida's 1997 actual expenses demonstrates the grossly understated nature of the cost estimates resulting from HAI model and national default inputs.[14] Exhibit No. 81 sponsored by Mr. Dickerson demonstrates the unreasonably low levels of investments and expenses resulting from HAI and national default inputs. For example:

➢ HAI estimates general support expenses approximately 58% less than actual for Sprint. This understatement is tied to an erroneous assumption which attributes approximately 60% and 54% (HAI filed one cost study for Sprint-United and one for Sprint-Central), of Motor Vehicles, Garage Work Equipment and Other Work Equipment to corporate overheads. HAI then inexplicably excludes this portion of these necessary assets. Motor Vehicles, Garage Work Equipment

[14] Sprint is not advocating that embedded book costs of operating expense levels are automatically appropriate forward looking cost estimates. In fact, Sprint's forward looking cost estimates contain very material reductions to actual booked cost. Rather, the actual costs serve as useful, factual and objective information in order to test the reasonableness of the results sponsored by Mr. Wood. (Dickerson, Tr. 2323.)

and Other Work Equipment is almost entirely utilized for the construction and maintenance of outside plant facilities. (Dickerson, Tr. 2323.)

➢ HAI estimates Plant Non-Specific expenses approximately 54% less than actual for combined United and Central companies. Again this reduction is based on an erroneous national default assumption that treats all companies in all states with the same broad brush of alleged inefficiencies. This arbitrary and excessive reduction is not supported by any data specific to Florida or to Sprint-Florida. (Dickerson, Tr. 2323-24.)

➢ HAI estimates digital switch maintenance expenses approximately 70% less than actual for combined United and Central companies. The justification for this excessive reduction comes from a 1993 New England Telephone incremental cost study. The AT&T and MCI witnesses provide no support for the association of the outdated cost study to a company the size of Sprint serving predominately rural territories in Florida. (Dickerson, Tr. 2324.)

➢ HAI estimates customer and corporate operations expenses approximately 80% less than actual for combined United and Central companies. The very size of this arbitrary expense reduction demonstrates that it is excessive. (Dickerson, Tr. 2324.)

Additionally, the operating efficiencies which the HAI sponsors claim should be implemented to achieve their proposed expense reductions have already been achieved by Sprint-Florida. For example, Sprint-Florida has already consolidated network maintenance centers; has already implemented use of automated provisioning systems and workforce management automated systems (which feed jobs to technicians with hand-held HAS units); has already converted to SONET technology; and has not hand-dug a posthole in years. (Dickerson, Tr. 2383.) Clearly the magnitude of expense reductions for alleged forward-looking assumptions within the HAI model and national default inputs are unreasonable and must be rejected.

G. The HAI Feeder and Distribution Cable Placement Fractions Inputs are Unreasonable

The HAI Inputs Portfolio contained in Mr. Wood's Exhibit No. 43 describes the national default assumptions for Placement Fractions for both Distribution and Feeder Cable. These HAI national default assumptions do not reflect a reasonable estimate of Placement Fractions within Sprint's Florida serving area. The HAI tries to fit a national square peg into a Florida specific round hole. Sprint-Florida places buried or underground cable in approximately 88% of its distribution cable, 97% of its feeder copper cable and 98% of its fiber feeder because in Florida it is inexpensive to dig trenches and less expensive than aerial to maintain.[15] HAI, however, has an extreme bias towards aerial cable. (Dickerson, Tr. 2327.)

HAI's bias towards aerial is not forward-looking and is certainly not least cost. For example, the density zone of 201 - 650 (which contains the largest number of Sprint customers), the HAI input for aerial distribution cable is 30% vs. Sprint's input of 12.4%. The HAI input for aerial copper feeder is 40% vs. Sprint's input of 2.8%, and the HAI input for aerial fiber feeder is 30% vs. 2% filed by Sprint. The HAI percent aerial plant input is subject to further overstatement due to the HAI model "Buried Available for Shift" input. This input claims to look at a least cost approach for build buried or aerial plant. Sprint's analysis has shown that this algorithm does not switch plant from aerial to buried, but only shifts from

[15] The surface structure of the Florida service territory consists of 76% of fine sand and 10% of sandy loam. These terrain types allow for relatively inexpensive placement of buried cable. In fact, the HAI maintenance factors show that the cost of maintaining aerial cable is 68% greater (13.7% aerial vs.8.2% buried) for the Central Telephone territory and 46% greater (6.3% aerial vs. 4.3% buried) for the United Telephone territory than buried cable. The same cost savings can be seen with the use of underground plant. The cost of maintaining aerial cable is 244% greater (13.7% aerial vs.4.0% underground) than underground for Central Telephone and 291% greater (6.3% aerial vs. 1.6% underground) for United Telephone. (Dickerson, Tr. 2327.)

buried to aerial. Therefore HAI will not model the overall least cost network in hurricane prone areas such as Florida.[16] (Laemmli, Tr. 2452.)

HAI also does not consider the building codes of the Florida service area. Building codes commonly require below ground telephone plant when building to new areas. For example, Destin and Altamonte Springs have issued ordinances prohibiting the use of aerial plant. This forward-looking trend will further reduce the need for aerial plant in the future. (Dickerson, Tr. 2328.)

H. The HAI Digital Loop Carrier Cost Input Values are Inappropriate for Sprint-Florida

The HAI model uses a national default input value for digital loop carrier (DLC) cost. Yet, the DLC input value is only an estimated amount without any supporting vendor quotes and, moreover, is inconsistent with reality. In fact, based upon a very recent installation by Sprint of the most forward-looking DLCs, namely, Next Generation Digital Loop Carriers (NGDLCs), the HAI model input values are approximately one-third the cost of Sprint's experience. (Dickerson, Tr. 2378-79.) The HAI model input values simply ignore the fact that a company the size of Sprint-Florida, or even Sprint, with its nationally negotiated purchasing contracts, cannot purchase equipment at a price that may have been quoted to a large RBOC in what may have been a unique purchasing opportunity. In fact, the HAI model sponsors' witness Mr. Wells conceded that actual ILEC experience with vendor quotes and prices is the best evidence of what the cost input values should be for that ILEC. (Wells, Tr. 2645-46.) To suggest that Sprint-Florida should have its network costs dictated by the costs incurred by, or the prices available to, another ILEC, or even a CLEC like AT&T, with very different

[16] For example, in 1985 Tallahassee was hit by hurricane Kate causing power to be out for an extended period due to the power services reliance on aerial plant, whereas telephone service remained almost entirely operational due to the greater percentage of buried and underground cable. (Dickerson, Tr. 2327.)

purchasing power, would essentially require Sprint-Florida to cost its network at a level it could never hope to achieve. This is despite the fact that Sprint-Florida, as a price-regulated ILEC, has every incentive to provide service at the lowest possible cost. (Dickerson, Tr. 2378-81).

<u>Issue 5 (a):</u> For purposes of determining the cost of basic local telecommunications service appropriate for establishing a permanent universal service mechanism, for which Florida local exchange companies must the cost of basic local telecommunications service be determined using the cost proxy model identified in Issue 2?

<u>Position:</u> *The LECs with more than 100,000 access lines.*

<u>Issue 5(b):</u> For each of the LECs identified in (a), what cost results from using the input values identified in Issue 5 in the cost proxy model identified in Issue 2?

<u>Position:</u> *The cost results from using the input values set forth in Exhibit KWD-1 are identified in Exhibit KWD-1 *

<u>Issue 6(a):</u> For purposes of determining the cost of basic local telecommunications service appropriate for establishing a permanent universal service mechanism, should the cost of basic local telecommunications service for each of the LECs that serve fewer than 100,000 access lines be computed using the cost proxy model identified in Issue 2 with the input values identified in Issue 4?

<u>Position:</u> *This issue does not apply to Sprint-Florida, so it has no position on this issue.*

<u>Issue 6(b):</u> **If yes, for each of the LECs that serve fewer than 100,000 access lines, what cost results from using the input values identified in Issue 4 in the cost proxy model identified in Issue 2?**

<u>Position:</u> *Not applicable.*

<u>Issue 6(c):</u> **If not, for each of the Florida LECs that serve fewer than 100,000 access liens, what approach should be employed to determine the cost of basic local telecommunications service and what is the resulting cost?**

<u>Position:</u> *Not applicable.*

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