BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of Determination of the cost of basic local telecommunications service, pursuant to Section 364.025, Florida Statutes.	DOCKET NO. 980696-TP

VOLUME 15

Pages 1625 through 1820

PROCEEDINGS:	HEARING
BEFORE:	CHAIRMAN JULIA L. JOHNSON COMMISSIONER J. TERRY DEASON COMMISSIONER SUSAN F. CLARK COMMISSIONER JOE GARCIA COMMISSIONER E. LEON JACOBS, JR.
DATE:	Wednesday, October 14, 1998
TIME:	Commenced at 9:00 a.m.
PLACE:	Betty Easley Conference Center Room 148 4075 Esplanade Way Tallahassee, Florida
REPORTED BY:	CATHY H. WEBSTER, RPR

APPEARANCES:

(As heretofore noted.)

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EXHIBIT INDEX

EXHIBIT	ID	ADMITTED
NO. 65, DWJ/BFP 1 thru 21	1639	

PROCEEDINGS

(Transcript follows in proper sequence from Volume 14.)

CHAIRMAN JOHNSON: We're going to go back on the record.

Do you have a preliminary matter?

MR. CARVER: Yes, ma'am; I do, before they begin their summary.

About an hour or so ago, maybe a little bit longer than that, AT&T handed out their notice that we discussed earlier in the morning. And I'm afraid it sort of confirms the concerns that I had.

My understanding about the purpose of the notice was that it was to do two things: It was to designate who was responsible for particular areas and also to designate a lead witness. And the point of this would be so that we basically know who to cross.

I mean, if we have two witnesses and they're both jointly responsible for everything, then we're going to have to do one of two things: Either every question will have to have some sort of a predicate to determine who it should be directed to, or, otherwise, every question will be sort of up in the air and they'll sort of volunteer, one or the other, which I don't believe really is an appropriate way to conduct cross-examination.

And we discussed this at some length during the prehearing conference and they were directed specifically to file a notice so that it would obviate this problem. And the notice that we have here basically just says that Mr. Pitkin performed the mathematical analysis but with the exception of one section, otherwise Mr. Wood and Mr. Pitkin are jointly responsible for everything. And no one is designated as a lead witness.

So we're kind of back to square one on this, which is I'm afraid we're going to have a panel examination. It's going to be somewhat unwieldy because they've given us very little indication as to who has done what or who we should direct the questions to.

CHAIRMAN JOHNSON: Mr. Hatch.

MR. HATCH: All I can offer you is that the request was made to designate responsibility for various portions of the testimony and we attempted to do that. This is what was provided to me as designating the various portions of the testimony.

It truly is joint testimony. And you can't necessarily say, although in some parts you can, but generally you cannot say Mr. Wood is solely responsible for one part and Mr. Pitkin is solely resporsible for the other part. That's the whole purpose of joint testimony.

And I would also point out it doesn't appear to

have been a problem with respect to the deposition that Mr. Carver took of both of these witnesses last week.

MR. CARVER: Well, I think it was sort of a problem in the deposition because what happened to some extent was exactly what I'm afraid is going to happen here, which is we'd ask Mr. Pitkin a question and then he would start to answer, then Mr. Wood would cut him off and he would answer and then we'd direct one to Mr. Wood and maybe he would answer and maybe Mr. Pitkin would help him out.

And it really was a fairly unwieldy process because we had two people in effect sort of collaborating on their answers to every question.

Now typically what happens, I think, is if you have sort of a joint process and then one person takes the stand and talks about the process, you know, to an extent, you know, that's the way it's typically done.

Now I could see a panel if you have discrete portions of the process that need to be addressed and you have people with particular expertise. But here, I mean, it appears that Mr. Pitkin did an underlying analysis, then he talked to Mr. Wood, Mr. Wood agreed with his conclusions; so now they're both taking the stand to support I suppose Mr. Pitkin's analysis. And I'm just not sure that that's really an appropriate use of the panel.

But, again, to get back to my first point, we

were hopeful that they could designate someone as the point person so that we would at least know who to direct questions to. And in the absence of that, I think it will be pretty much like the deposition, which every question is sort of a jump ball and one will answer, the other will answer, both will answer. It's just not the way cross-examination is typically done and I don't think it's appropriate.

And, again -- Mr. Fons just raised a good point, which is will just one person answer it? Will both answer it? Will they, you know, build their answers off one another? It's going to be difficult.

MR. JOHNSON: Well, I'm hearing Mr. Hatch say -- And I was just trying to read the notice that was filed -- that the way that a lot of the information was jointly prepared.

Mr. Fons.

MR. FONS: Then I would suggest, Chairman, if you would, to instruct that only one of the witnesses answer, that we can designate which person we want to answer the question and that person will answer. Otherwise, we don't know which person is going to answer, whether we're going to have two people answering; if one falls into problems, the other one is going to come in and try to rectify it. That's not -- This is not a

COMMISSIONER CLARK: I guess I don't see the problem here. If that happens, we'll deal with it. And if they were both responsible, they're both responsible. Cross-examination is designed to elicit information.

MR. FONS: I agree with you, and that's the problem. We will not be able to elicit information because we won't know which person is providing the answer.

COMMISSIONER CLARK: Whoever moves their mouth is the one who is providing the answer.

MR. FONS: That's fine; if that person moves their mouth and they're the only person that can answer the question.

COMMISSIONER CLARK: I think it's -- I just -- We've had panels before and I don't recall it being a problem.

MR. FONS: Right, we've had panels before, but the panels were made up of people who had discrete pieces of testimony. The panels were made up of people who have had disciplines that were separate and you could go to their particular testimony and ask them a question about their testimony.

Here we've got a two-headed witness that claims to have jointly written the testimony. Now if you wanted to get down to the bottom line, you'd have to ask them now what sentence did you write; what sentence are you

responsible for or within that sentence which words are you responsible for. It's not a discrete

COMMISSIONER GARCIA: Aren't they both on the record? I mean, you know, how does that make it more difficult for you?

MR. FONS: Well, it would be the same thing if we did a tag team as lawyers, if we changed lawyers in the middle of the cross-examination of a witness. You're going to have a very disjointed, a very complex, and perhaps unfair result.

Now I don't understand why if they wanted to have Mr. Pitkin testify to something, they could have put it all in one piece of testimony from Mr. Pitkin; and if they wanted Mr. Wood to testify, they could have put it in one piece of testimony. Here they've just glummed it together and are saying that they're both jointly responsible for it. And we're not -- And they certainly are not sharing different disciplines. They both are coming in saying the same thing. It's just very awkward.

And what we're trying to do is figure out some way to do it that takes some of the awkwardness out of it. And perhaps the one way to do it is that the first person that answers, if this is going to be like a game show, that the first person to ring in gets the points, then that person takes the points or loses the points, but the other

person doesn't get to come in and save the game for them.

COMMISSIONER CLARK: I would agree with that, that one person should answer it and that's it.

MR. CARVER: If I could just add one thing further. I mean, there was a comment about we've had other panels. And that's certainly correct. We have other panels in this case.

I think the purpose of the notice was to try to sort that out so it could be done in an orderly fashion. And I'll give you an example of what I think should be done.

With the Georgetown Group appearing on behalf of BellSouth later, we have designated Mr. Madan as the point person and he will attempt to answer all questions. If there are specific questions that go to engineering issues, Mr. Newton can answer them. If there's specific questions that go to accounting, Mr. Dirmeier can answer them, but we've designated one person who is responsible for in effect presenting the joint analysis of the three people in a single consulting group who work together. And I think that's an appropriate way to do it.

What we have here is basically two people who -- And I'm not clear on what the process was, but they're presenting this as a joint analysis. And, again, I believe the purpose of the notice was to designate one person to

MR. WILLIAMS: Your Honor, I have one other procedural matter. This may be a two-headed panel, but we can only see one of them.

COMMISSIONER JOHNSON: Do they need to scoot down?

MR. WILLIAMS: And I was wondering if Mr. Pitkin could take the seat -- If they could slide over.

Thank you.

WITNESS WOOD: He has the better looking head.

MR. WILLIAMS: Well, I was actually asking him to change places.

CHAIRMAN JOHNSON: You need a --

MR. WILLIAMS: No, I'm just kidding. Thank you.

CHAIRMAN JOHNSON: Can you see him now?

MR. WILLIAMS: Yes, thank you.

CHAIRMAN JOHNSON: Okay.

MR. LAMOUREUX: Before I begin, there is going to be a reference in the summary to a couple of the exhibits behind the testimony. And I'd just like to hand out copies of those exhibits.

Mr. Wood, could you please state your name?

Let me begin: I guess AT&T calls Don Wood and Brian Pitkin as its next witnesses.

And I know Mr. Wood has been sworn in. I don't

to be prepared joint rebuttal testimony which was filed on September 2nd, 1998?

A (Witness Pitkin) Yes, we did.

Q Are there any changes or corrections that you have to make to the testimony at this time

A (Witness Pitkin) I have one correction. Exhibit DJW/BFP-11, the title on that exhibit specifies an FDI code of 1008431. That FDI code should be 1010499. And that appears on all of the pages of the exhibit.

Q Any other changes or corrections to make to the testimony

A (Witness Pitkin) No.

Q And are there also exhibits to the testimony as well?

Are there also exhibits to the testimony as well?

A (Witness Pitkin) Yes.

Q How many exhibits are there?

A (Witness Pitkin) Twenty-one.

MR. LA'OUREUX: Madam Chairman, I'd like to designate as a composite exhibit Exhibits DJW/BFP-1 through 21 as Hearing Exhibit 65.

CHAIRMAN JOHNSON: Sixty-five.

Could you give me that short title again?

MR. LAMOUREUX: Sure. These will be exhibits DJW/BFP 1 through 21.

CHAIRMAN JOHNSON: Okay. It will be marked as 65.

(Exhibit 65 marked for identification.)

BY MR. LAMOUREUX (Continuing):

Q If I were to ask you the same questions as are contained in your testimony, would your answers be the same?

A (Witness Pitkin) Yes.

Q Is that true for you, Mr. Wood, as well?

A (Witness Wood) Yes.

Q Do you have a summary of your testimony prepared?

A (Witness Pitkin) I do.

Q Would you give that now, please?

A (Witness Pitkin) Yes. Thank you.

Good afternoon. My name is Brian Pitkin and here on my left, as you know, is Don Wood.

Our testimony discusses many problems with the BCPM methodologies. Some of these include the BCPM dropping customer locations or locations that simply disappear in the model's preprocessing stages; the BCPM's inefficient and arbitrary gridding process for carrier serving area design, a process that har been specifically rejected by the FCC Staff.

This, as you know, can arbitrarily split a group of customers and leads to too many expensive DLC systems.

The BCPM's inefficient feeder and subfeeder

design, which overstates route miles and cost; and the BCPM's failure to limit loops to 18,000 feet.

This is a model supported by witnesses stating that a loop should not exceed 12,000 feet, but this is the only model in this proceeding that has customers over 18,000 feet on copper.

However, rather than focusing on the methodological differences between the HAI Model and the BCPM, we have been diverted down a path of comparing these models to a minimum spanning tree, or MST. We feel that this is unfortunate because the MST is not a very worthwhile measure for evaluating these models.

First, let me take you to Exhibit DJW/BFP-19, which should be in front of you, and is entitled "Comparison of HAI Model and BCPM Model distances to the Minimum Standing Tree Distance by Density Zone."

Now I know that these numbers are different than other comparisons you have seen. However, the difference is that these numbers are right because they consistently apply the MST to both models.

As you can see, neither model actually matches the MST in the lowest density zone. But the BCPM falls farther short.

However, for the lowest two density zones where USF support is most likely to be required, the HAI Model

places 25% more route miles than the MST, while the BCPM places only 8% more route miles than MST. And you can look at those -- You can get those numbers by adding up the MST distances and the modeled distances in those first two density zones.

It appears clear to me that the BCPM's sponsors do not think that a model must meet the MST distance. If they did, they could not be supporting the BCPM.

Now if you flip to Exhibit DJW/BFP-16, on page 2, which should be the second sheet you have, and it is titled "Comparison of HAI Model and BCPM Model Route Miles," you will see that for the state of Florida the HAI Model places more distribution cable than the BCPM.

I also fail to understand how the BCPM's sponsors can suggest that the HAI Model does not place enough cable when, in fact, it places more distribution cable than the BCPM in the lowest two density zones and 3,900 more miles of distribution cable than the BCPM for the state of Florida.

Let me take a step back and describe to you what MST is. MST is essentially the distance required to connect a group of points. Thus, if you have four points up here in a square, you would have a greater MST than if you had those four points tightly grouped together right here in the center. This is why the MST is also a measure

of dispersion, or how far apart the points are from one another.

If either party knew where all of the customers actually were, then an MST could be a valid statistic. However, because both models use overly conservative surrogate placement assumptions, the MST is known to be overstated. For this reason, the MST is not a valid comparison -- either for the HAI Model or for the BCPM.

Put simply, the only thing you have in terms of a validation process is to compare what these two models produce and the HAI Model performs better against the MST standard and, as I said earlier, the HAI model has almost 4,000 more route miles of distribution cable than the BCPM.

So, you, the Commission, are going to have to judge these models based on the methodologies employed in the models and based on your evaluation of the reasonableness of those methodologies.

This is why Mr. Wood and I are not suggesting that the BCPM should be rejected because it fails the MST test more than the HAI Model, because we do not think this is a meaningful measure. Mr. Wood and I are suggesting that the BCPM should be rejected because of the various methodological problems in the BCPM that force it to design an arbitrary and inefficient network.

Thank you.

MR. LAMOUREUX: Move the admission of Mr. Wood and Pitkin's rebuttal testimony in the record as read.

CHAIRMAN JOHNSON: It will be admitted.

REBUTTAL TESTIMONY OF

DON J. WOOD AND BRIAN F. PITKIN

ON BEHALF OF AT&T COMMUNICATIONS OF THE

SOUTHERN STATES, INC. AND

MCI TELECOMMUNICATIONS CORPORATION

DOCKET NO. 980696-TP

Q. PLEASE STATE YOUR NAMES, BUSINESS ADDRESSES AND DESCRIBE YOU BACKGROUNDS.

A. My name is Don J. Wood. My business address is 914 Stream Valley Trail, Alpharetta, Georgia. I am the same Don J. Wood who prefiled direct testimony in this proceeding on August 3, 1998, and my background and experience are described in Exhibit: _____ (DJW/BFP-1) to that testimony.

My name is Brian F. Pitkin. My business address is Klick, Kent & Allen, Inc. ("KK&A"), 66 Canal Center Plaza, Suite 670, Alexandria, Virginia 22314. After graduation from the University of Virginia, I joined Peterson Consulting, L.P., where I was involved in developing and analyzing large databases and performing economic analyses. In 1994, I joined KK&A. Since joining the firm, I have been involved in cost analyses for the telecommunications and railroad industries. Many of the analyses that I have worked on have been submitted in regulatory and court proceedings.

we describe a major problem with the BCPM that prevents the model from serving customers with the network that the BCPM constructs. In Section IV, we critique the BCPM switching module, transport module and signaling costs. In Section V, we address, in more detail, the BCPM methodology for calculating the cost of the loop -- the largest cost component of universal service. In Section VI, we critique the BCPM input values. In Section VII, we address several claims that the BCPM sponsors make regarding comparisons between the HAI Model and the BCPM. In Section VIII, we summarize our findings and conclusion that the BCPM cannot provide a reliable estimate of the costs associated with providing basic local exchange service in the state of Florida. In contrast, the HAI Model sponsored by AT&T and MCI (and presented in Don Wood's direct testimony) does provide a reliable estimate of universal service costs.

Q. ARE THERE EXHIBITS TO YOUR TESTIMONY?

A. Yes. Our testimony includes 21 exhibits, as follows:

DJW/BFP-1: The BCPM serving area design is arbitrary

DJW/BFP-2: Associated Press article titled "Assessment Sought on Bell Rates"

DJW/BFP-3: FCC Public Notice titled "Common Carrier Bureau Seeks

Comment on Model Platform Development," Released August 7, 1998

DJW/BFP-4: Maps illustrating that the BCPM does not serve all customers

DJW/BFP-5: BCPM output reports showing the investment and cost generated by the BCPM using the BCPM's "default switching method" and the "SCM switching method"

DJW/BFP-6: HAI geocoding success rate by state and density zone

DJW/BFP-7: AT&T and MCI June 10, 1998 Ex Parte filing with the FCC titled "HAI Model 5.0a – Why it Engineers the Appropriate Amount of Distribution Plant"

DJW/BFP-8: BCPM ultimate grids vary in size across the United States

DJW/BFP-9: Bellcore comparison of bush v. branch design

DJW/BFP-10: Graphical comparison of the BCPM and HAI Model approaches to customer location and outside plant design

DJW/BFP-11: Illustration of MST Analysis on the BCPM

DJW/BFP-12: Graph of HAI Model Copper Analog Distribution Loop Lengths

DJW/BFP-13: The BCPM does not build cable to reach modeled customer locations

DJW/BFP-14: Square lots are inefficient and result in increased developer costs

I. EXECUTIVE SUMMARY

Q. PLEASE SUMMARIZE YOUR CRITICISMS OF THE BCPM METHODOLOGY.

A. The BCPM's greatest flaw is its failure to model a basic local exchange network using most-efficient, forward-looking costs based on the most recent commercially available technology and equipment and generally accepted design and placement principles, as required by F. S. 364.025 (4) (b).

While all cost proxy models must make simplifying assumptions (in order to complete processing in reasonable time), these assumptions should reflect, to the maximum extent feasible, the real world decision-making that engineers use to design outside plant efficiently. The BCPM does not make reasonable assumptions in estimating the costs that an efficient provider would incur for providing basic local telecommunications service.

As we will demonstrate in detail below, the BCPM suffers in comparison with the HAI Model on each of the critical design characteristics of the network. First, the BCPM takes no advantage of the large amount of actual customer location information that is currently publicly-available in

the marketplace, nor does it rely upon any such data that is presumably in the possession of BellSouth or the other incumbent local exchange carriers ("ILECs"). Instead, the BCPM relies upon a series of unsupported assumptions to *allocate* all customer locations to microgrids -- areas of approximately 1,500 feet by 1,700 feet (a process discussed in greater detail later in this testimony) -- that the BCPM arbitrarily overlays on the state of Florida. Because the BCPM does not use actual customer location information that is available in designing its carrier serving areas and, instead, evenly-distributes customers along roads, it cannot reflect the concentration of customers that exist in the real world. The BCPM approach of dispersing customers as much as possible on a subset of roads in each CB tends to overstate costs. In short, a cost proxy model that does not employ the most accurate demand information available in its algorithms cannot efficiently design facilities to serve these customers.

Second, the way in which the BCPM methodology employs these road surrogate locations result in customers not being located at all. As we describe below, the BCPM does not serve all households -- a requirement for cost proxy models that are to be used to calculate universal service.

Third, the BCPM relies upon this same arbitrary grid structure to establish

the physical boundaries of its carrier serving areas. As we explain in more detail below, the largest grid size employed by the BCPM is too small to take full advantage of the digital loop carrier ("DLC") technology that is currently available for concentrating customer calls. As a result, the BCPM models too many serving areas in the state, requiring excessive amounts of concentration equipment (*i.e.*, serving area interface -- SAI -- and Digital Loop Carrier -- DLC) and too much subfeeder to connect these carrier serving areas to main feeder cable routes. In addition, because the geographic location of the grid system is arbitrary -- ignoring actual customer locations -- it often subdivides groups of customers that could (and, in the real world, would) be served together, violating both common sense and accepted outside plant engineering practice. Exhibit: _____ (DJW/BFP-1) illustrates that the BCPM will treat 4 customers differently depending on the location of these customers relative to the arbitrary grid location.

Fourth, while the BCPM employs too much DLC and too much subfeeder, it still fails to provide sufficient distribution plant to actually reach the customer locations that it hypothesizes. This arises because of two additional assumptions made by the BCPM, *i.e.*, (1) to build distribution plant only within a "road-reduced" quadrant (the area of which is set equal

to the road mileage in the quadrant, multiplied by 1,000 feet), and (2) to "limit" the amount of connecting, backbone, and branch cable constructed in that quadrant to no more than the road distance in that quadrant. As we demonstrate below, the effect of these assumptions is to underestimate the amount of distribution cable required and, in most cases, to construct *even less* cable than the model estimates is required. As a result, the HAI Model builds approximately 18 percent more backbone and branch cable -- the portion of the outside plant network that actually runs down streets and connects to customers -- than does the BCPM.

The shortcomings in the BCPM result in the worst of all worlds -- substantially overstated costs for a basic local exchange network that fails to reach many of the Florida customers that it is intended to serve. The carrier serving area design employed by the BCPM -- which fails identify accurately customer locations and serve them efficiently -- is its most critical design flaw, one that affects virtually every other calculation in the model.

Q. HAVE OTHER STATES REACHED CONCLUSIONS SIMILAR TO YOURS REGARDING THE DEFICIENCIES IN THE BCPM AND THE SUPERIORITY OF THE HAI MODEL?

network costs. Moreover, the HAI Model more accurately locates customers and is more open to public review. Therefore, the Commission adopts the HAI Model to establish the Kentucky USF and determines that the HAI Model complies with the FCC's criteria as discussed below.[3]

The Minnesota Public Utilities Commission also found that:

In his report, the ALJ favored the HAI model over the BCPM, and over a "blending" of the models. However, the ALJ also favored certain modifications of inputs and other changes. Having reviewed the record and considered the arguments, the Commission agrees with the ALJ that the HAI provides the more accurate and reliable method for estimating the costs of serving Minnesotans living in rural, insular and high costs areas. Therefore the Commission accepts, adopts and incorporates herein by reference the findings and recommendations of the ALJ's Report.[4]

The report of the Administrative Law Judge in Minnesota states that:

The Department strongly endorses the HM because it believes the HM will better accomplish the FCC's goals for two principal reasons. First, it has a more accurate system for locating customers than BCPM and it minimizes reliance on surrogate location techniques. Second, the HM's switching module generates more accurate switching costs than BCPM's SCM module. For both these reasons, the Department believes that the HM will generate a more accurate prediction of the distribution network and its associated costs. Moreover, the

HM meets the FCC's ten criteria in 250. DPS at 54-55. (page 44, para 186).

The ALJ concludes that the HM, with the modifications of inputs and other changes recommended in this report, should be selected as the cost study to be submitted to the FCC. It meets the requirements of 250 better than the BCPM. In particular, and most importantly, it best reflects "the least-cost, most-efficient, and reasonable technology currently being deployed," and "long-run, forward-looking economic costs." Compliance to these standards is apparent throughout the model's design, logic, and inputs. (Page 44, para 189).

The states of Hawaii and Nevada also have concluded that the HAI Model is superior to the BCPM.

Q. HAS THE FCC PROVIDED ANY INSIGHT INTO WHICH MODEL'S METHODOLOGY IT PREFERS?

A. Yes. On August 7, 1998, the FCC released a Public Notice titled "Common Carrier Bureau Seeks Comment on Model Platform Development" (this FCC Public Notice is included as Exhibit: _____ (DJW/BFP-3) to our testimony), in which it states:

[i]n the Further Notice, the Commission comments on the availability, feasibility, and reliability of using geocoded data to determine the distribution of customers in the federal mechanism. Many commenters from across the spectrum of the industry agree that geocoded data that

> identify the actual geographic locations of customers are preferable to algorithms intended to estimate customer locations based on information such as census block data.

In addition, the FCC notes that:

> in this public notice, we consider a model platform that groups customers using a clustering approach because it appears to have advantages over gridding approaches. HAI has placed the computer code for its clustering algorithm on the record in this proceeding.

Thus, it appears that for virtually all aspects of the customer location process, the HAI Model uses (or has been adjusted to incorporate) an approach that is endorsed by the FCC. The BCPM does not geocode customers, and does not use a clustering approach to identify serving areas.

II. PRELIMINARY ISSUES TO BE ADDRESSED BEFORE EVALUATING COST MODELS

Q. THE PROPONENTS OF THE BCPM TYPICALLY RAISE A NUMBER OF "RED HERRING" CRITICISMS OF THE HAI

MODEL IN AN EFFORT TO IGNORE SUBSTANTIVE ISSUES THAT DISTINGUISH THE TWO MODELS. WHAT ARE SOME OF THE ISSUES THAT ARE *NOT* CENTRAL TO THIS PROCEEDING?

A. Issues that do not constitute significant differences between the models should not be the primary focus of these proceedings. For example, there is little point in a conceptual discussion concerning the need for or the extent of preprocessing, because both models require extensive preprocessing in order to get the information into useable format (it is important to recognize, however, that substantive cost calculations dealing with feeder and subfeeder are contained in the BCPM preprocessing, which makes it effectively impossible to modify these assumptions in the BCPM; the corresponding HAI Model calculations are contained in the HAI Model itself, making them easier to review and modify). Other examples of "red herrings" include:

X *Should a model contain loops with copper distances in excess of 12,000 feet?* In fact, both models construct a small percentage of loops in Florida with copper distances in excess of 12,000 feet. As a result, the feasibility of this design feature should not be an issue in this proceeding.

X *In estimating costs, is it appropriate for a model to assume an even*

A. Although business locations generally are defined identically in the HAI Model and the BCPM, residential locations are defined differently. The HAI Model defines a customer location as a location likely to require basic local telephone service, and uses a *household* count (from either the Census data or the Metromail database, whichever is greater). A "household" generally reflects an occupied housing unit, or one that has recently been occupied. In contrast, the BCPM methodology defines a customer location as a *housing unit* -- which includes both occupied and unoccupied residential locations. Defining residential customer locations in terms of *households*, as is done in the HAI Model, is consistent with the FCC's Universal Service Order, criteria No. 6, which states: "[t]he cost study or model must estimate the cost of providing service for all businesses and *households* within a geographic region." [emphasis added]

The New Mexico State Corporation Commission found that "the use of housing units, rather than households, results in a cost estimate that reflects the assumption that plant is built in areas where no one lives and for which the local exchange company has not constructed facilities." This Commission ultimately concluded that "the use of housing units is a significant shortcoming in BCPM."[5]

Q. HOW ARE FEEDER, AND DISTRIBUTION CABLE DEFINED IN THE TWO MODELS?

A. The HAI Model uses a consistent definition -- defining all cable on the "customer side" of the feeder distribution interface ("FDI" -- the term used in the BCPM) or serving area interface ("SAI" -- the term used in the HAI Model) as distribution plant, and all cable on the "central office side" of the FDI or SAI as feeder plant. This definition is generally accepted in the industry (*see*, for example, page 47 of the BCPM 3.1 documentation, which defines the FDI as "the cross connect where copper feeder facilities are connected with copper distribution facilities").

The BCPM proponents have adopted non-standard definitions of feeder and distribution facilities. The BCPM output actually classifies *all* connecting cable constructed by the model as feeder plant, even when some of this cable is on the customer side of the FDI. This non-standard classification is explicitly recognized in the BCPM 3.1 documentation, which states the "while this is typically considered distribution cable, the Model has fixed the classification of this cable as feeder. In a future release of the BCPM, this cable will be classified differently." (BCPM 3.1 Methodology, Section 6.7, footnote 37).

In the comparisons that we make below, we use a consistent definition of feeder and distribution plant for cable installed by *both* models. All plant on the central office side of the FDI or SAI is classified as feeder cable; all plant on the customer side of the FDI or SAI is distribution cable. As noted earlier, this convention is consistent with standard practice in the industry.

Q. SHOULD EMBEDDED DATA BE USED TO VALIDATE THE COST PROXY MODELS?

A. No. In this proceeding, neither cost proxy model is attempting to model the existing network. Instead, the cost proxy models submitted in this proceeding purportedly are designed to be forward-looking, reflect use of the best, currently-available technology and engineering design standards, be economically efficient, and reflect the long-run. Obviously, embedded networks do not meet these conditions, so comparisons of model outputs to embedded network characteristics can be misleading.

This fact has been recognized by the Kentucky Public Service Commission, which found that:

> The HAI Model was developed to estimate the costs incurred by an efficient carrier building a network using current technology and costs. The consulting group designing the model used long-run forward-

looking costs. The model correctly applies a long-run assumption by treating the ILECs' embedded cost structure, except for the location of wirecenters, as variable and avoidable.[6]

In addition, it is appropriate to be extremely skeptical regarding the relevance and accuracy of embedded and historic data, especially when the support for the data has not been provided. While the ILEC's have provided proprietary inputs into the BCPM, they have not produced the sources to these inputs. A recent article titled "Assessment Sought on Bell Rates," attached as Exhibit: _____ (DJW/BFP-2), reveals that "an audit by the Federal Communications Commission show that some of the equipment the Bells have on their books cannot be accounted for."[7]

Again, F. S. 364.025 (4) (b) rejects the use of embedded characteristics and historic information and requires that the cost model use total forward-looking costs based on the most recent commercially available technology and equipment and generally accepted design and placement principles.

III. A SERIOUS FLAW IN THE BCPM DESIGN ASSUMPTIONS RENDERS THE MODEL'S NETWORK INCAPABLE OF PROVIDING UNIVERSAL SERVICE

described later in this testimony, we received from BellSouth the detailed microgrid data for BellSouth's service territory in Florida. This information was compared to the ultimate grid data that is part of the input file passed from the BCPM preprocessing to the BCPM, itself. We identified several geographic locations where the BCPM data showed *no* occupied ultimate grid -- which caused the BCPM model to conclude that no subfeeder, DLC, or distribution plant was required -- but where the more detailed data for the microgrids comprising the allegedly unoccupied ultimate grid are occupied (because they have been allocated customers by the BCPM preprocessing).

Exhibit: _____ (DJW/BFP-4) contains examples of this phenomenon. In each case, we have shown the customers allocated to the microgrids within each ultimate grid, even where those microgrids are located within supposedly unoccupied ultimate grids. For the sake of comparison, we have shown three maps for each wire center (one Florida wire center and two Texas wire centers). The first map shows the number of households reported by the Census data for each Census Block. The second map shows the distribution areas to which the BCPM actually builds facilities, illustrating that the BCPM network built in each of these wire centers does not serve all of the households located in the wire center. The last map

shows the HAI Model clusters, and demonstrates that the network built by the HAI Model *does* serve all of these households.

The bottom line is that the BCPM fails to build *any* outside plant to some of these occupied locations, even though the BCPM preprocessing demonstrates that there are customers in these locations (this situation is most likely to occur in a large census block with relatively few customers and a substantial amount of road distance -- in such circumstances, the BCPM preprocessing will allocate a fractional customer to the microgrid). When these microgrids are aggregated into a single ultimate grid, this process could result in an ultimate grid with only a fractional customer. Although it is difficult to be sure (because the BCPM preprocessing is not easily reviewed), some portion of these fractional ultimate grids are dropped before data is passed to the BCPM itself. This error within the BCPM preprocessing clearly violates criteria number six of the FCC's Universal Order, which requires that, "[t]he cost study or model must estimate the cost of p oviding service for *all* businesses and *households* within a geographic region." (emphasis added)

IV. THE BCPM DEFAULT SWITCHING METHOD OVERSTATES COSTS AND THE TRANSPORT AND SIGNALING

COSTS ARE BASED ON EMBEDDED DATA

BellSouth and Sprint Have Elected to Use the ABCPM Default Method for the Development of Switching Costs, Which Leads to a Significant Overstatement of Switching Costs

Q. THE BCPM RUNS FILED BY BELLSOUTH AND SPRINT IN THIS PROCEEDING RELY ONLY ON THE "BCPM METHOD" FOR CALCULATING SWICHING COSTS. DOES THIS CONCERN YOU?

A. Yes. It appears that the switching costs resulting from the "BCPM method" are significantly overstated. In Florida, GTE filed the BCPM using SCM inputs for its wire centers while BellSouth and Sprint used the "BCPM method". Overall, running the BCPM switching module for GTE's Florida service territory using the "BCPM method" would generate switching investment 28% higher than the switching investment that was generated by GTE using the SCM inputs for the same territory.

Similarly, in Washington state, U S WEST filed the BCPM with SCM inputs for 106 wire centers. Overall, running the BCPM switching module for these U S WEST wire centers using the "BCPM method" generated

switching process, it is important for us to point out that U S WEST -- one of the BCPM developers -- has elected to rely on another method (the "SCM method") which yields switching costs that are approximately one-half of the switching costs produced by the default "BCPM method."

Q. HAVE OTHER STATE COMMISSIONS BEEN CRITICAL OF THE BCPM SWITCHING COSTS?

A. Yes. The Minnesota Public Utilities Commission found "that the BCPM's use of existing switch design is not consistent with what an efficient carrier would put in place today and tends to overstate costs." (Page 23, para 97) This conclusion is largely based on the analysis of Mr. Legursky, a consultant to the Minnesota Department of Public Service:

> Both models can use the FCC switch cost as inputs, but both use their own defaults. Mr. Legursky analyzed the HM and BCPM switching modules to determine whether either module produced results in line with his knowledge of actual switching costs. (Tr 974) He concluded that the HM's results were "much better, but still conservative." (Tr 954)
>
> Mr. Legursky acknowledged that the HM derived switch costs from a regression curve calculated

from just four data points. (Tr 973) His concern however, was not with the derivation of the cost curve, but rather with whether the curve generated accurate cost estimates. He testified: "I have absolute confidence in the results that are produced by the regression curve." (Tr 975) Mr. Legursky described the results of the BCPM methodology as "terrible" and as "way out of line with current industry practice" (Tr 953-54)

The BCPM Transport and Signaling Calculations are Based on Embedded Design, Not Forward-Looking Design

Q. DO YOU HAVE ANY COMMENTS ON THE BCPM TRANSPORT AND SIGNALING COSTS?

A. Yes. The BCPM transport and signaling modules are based on embedded network configurations. Because these embedded configurations were built incrementally to serve demand as demand has risen over time, they most likely are not optimal. In addition, new technology has outdated much of the old technology and can now serve the same purpose more efficiently (*i.e.*, with both lower initial costs and lower maintenance costs).

While the BCPM signaling module "[u]ses the existing SS7 signaling network as the basis for the SCPM network" (based on embedded data), review of the BCPM signaling calculations indicates that no explicit modeling of signaling costs is performed at this time, which conflicts with one of the FCC's requirements for cost proxy models and F. S. 364.025 (4) (b). Instead, the user must employ an input table that is based on results produced by the "Signaling Cost Proxy Module" for parts of U S WEST's operating region.

V. CALCULATION OF LOCAL LOOP COSTS

The Accurate Calculation of Local Loop Costs is Based on a Series of Essential Steps

Q. WHAT ARE THE CRITICAL STEPS IN MODELING THE COST OF THE LOCAL LOOP?

A. The critical steps in this process are:

1) identifying residential and business customer locations in each wire center;

2) aggregating these customers into efficient carrier serving areas and distribution areas (distribution areas may be subsets of carrier

serving areas);

3) designing an efficient system of feeders and subfeeders to connect each of the serving areas to the wire center, consistent with current outside plant engineering practices;

4) locating properly the serving area interface ("SAI") and/or digital loop carrier ("DLC") equipment in each serving area; and

5) designing an efficient system of distribution plant (backbone, branch, and road cable) to connect customer locations to the SAI/DLC equipment.

The remainder of this Section critiques the BCPM in each of these areas.

In Direct Contrast to the HAI Model, The BCPM Fails to Accurately Identify Customer Locations

Q. HOW DOES THE BCPM DETERMINE THE PHYSICAL LOCATION OF CUSTOMERS FOR THE LOCAL LOOP?

A As noted earlier, the BCPM makes no attempt to determine the physical location of customers in designing its network. Instead, it relies upon a series of allocations in order to distribute all customers in a Census Block ("CB") to a grid network that is arbitrarily overlaid on each CB. The BCPM allocation rules assume that customers should be assigned to each

grid in proportion to the amount of a CB's road mileage (for selected road types) that traverses each grid (the BCPM assumes that road types such as US highways, State highways, neighborhood roads, and city streets are equally likely to serve basic local exchange customers).

The BCPM customer allocation assumptions are flawed for several reasons. First, there is no reason to assume -- and no evidence to support an assumption -- that each of the road types selected by the BCPM developers for inclusion in the calculations has an equal probability of serving basic local exchange customers. Logic suggests that neighborhood streets are more likely to serve telephone customers than are roads through national parks.

Second, except in neighborhood streets, it is unlikely that customers would be evenly-distributed along the selected roadways. Our own day-to-day observations tell us that customers tend to be clustered, rather than evenly-dispersed along roadways. As is the case in any network industry, it is more efficient (*i.e.*, less costly) to provide basic local exchange service to customers that are grouped together than to serve customers that are evenly dispersed. Thus, the BCPM base-line assumption that all customers can be allocated to grids based upon road mileage is

unreasonable.

Q. ASIDE FROM "OUR OWN DAY-TO-DAY OBSERVATIONS," DO YOU HAVE ANY EVIDENCE TO SUPPORT YOUR SUGGESTION THAT THE BCPM ROAD SURROGATE APPROACH OVERSTATES COSTS BY ARTIFICIALLY DISPERSING CUSTOMERS?

A. Yes. It is possible to use a minimum spanning tree ("MST") to estimate the amount of dispersion between customer locations. Essentially, the MST is the shortest distance required to connect a set of points, assuming no additional "intersection" points are added, which may shorten this distance. In other words, the shortest distance to connect a group of points when the connecting link must go directly from one point to another, and not intersect itself at some additional location. Thus, the MST is also a measure of dispersion or how far apart the points are from each other.

AT&T and MCI have provided us with MST results for two different HAI Model datasets. The first dataset uses the actual geocoded locations from the HAI Model, but uses the BCPM road surrogate approach for non-geocoded locations (rather than that CB boundary assumption normally employed in the HAI Model). The second dataset applies the BCPM road

surrogate approach to *all* customer locations. This was done to identify the extent to which the BCPM road surrogate assumption overstates the true customer dispersion. In the lowest density zone (0 - 5 lines per square mile), the first dataset generated a MST distance of 1,188 miles, while using the second dataset (employing road surrogates for all customer locations) generated a MST distance of 1,234 miles -- an increase of about 4%. For the second lowest density zone (5 - 100 lines per square mile), the first dataset resulted in a MST distance of 9,310 miles, while using road surrogates for all customer locations results in a MST distance of 10,102 miles -- an increase of approximately 9%. For the lowest two density zones combined, using the BCPM assumption that all customers are located along roads yields a MST result that is about 8% greater than if actual geocoded data were incorporated.

The above percentages are a conservative estimate of the amount of overstatement caused by the BCPM customer location assumptions, because they reflect the effect of using road surrogates for only those locations that originally were physically geocoded in the HAI Model. In other words, changing the 34% of customer locations that were successfully geocoded in the lowest density zone of the HAI Model to road surrogate locations increases the MST distance by over 4%. We

anticipate that use of the road surrogate approach for the other 66% (non-geocoded locations) also exaggerates customer dispersion. Similarly, if changing the 62% of geocoded locations in the second lowest density zones yields a MST increase of 9% then the road surrogate approach for the other 38% is also likely to overstate true dispersion. Thus, overall dispersion in the lowest two density zones is likely overstated by substantially more than 8%.

Based on this analysis, we conclude that the assumption implicit in the BCPM customer location process -- *i.e.* that it yields a useful estimate of customer locations within a wire center -- is incorrect, because the BCPM customer location process does *not* yield a reliable estimate of the dispersion of customers within a wire center.

Q. HOW DOES THE HAI MODEL LOCATE CUSTOMERS?

A. The HAI Model uses geocoding to assign precisely a large proportion of basic local exchange customers to their actual physical location. In Florida, 70% of the residence customer addresses have been geocoded with a latitude and longitude to within 50 feet of their actual locations (Exhibit: _____ (DJW/BFP-6) shows the residential geocoding success rate by density zone for each state and the national averages). The

remaining customer locations are assumed by the HAI Model to be evenly-distributed along the perimeter of the CB in which the customers are located. Because it identifies actual physical locations for the majority of the Florida telephone subscribers, the HAI Model is clearly superior to the BCPM, which identifies no actual physical locations for any of these customers.

Q. IS THE HAI MODEL APPROACH OF PLACING NON-GEOCODED CUSTOMERS ON THE PERIMETER OF CENSUS BLOCKS REASONABLE?

A. Yes, it is reasonable -- evidence suggests that the resulting customer dispersion (for *non-geocoded* customers only) is similar to the dispersion that occurs if the BCPM road surrogate approach is used for non-geocoded locations in the lowest two density zones of Florida.

The MST distance for the lowest two density zones using the default HAI Model methodology (*i.e.*, geocoding locations and using CB surrogates only for the remaining, non-geocoded customers) is 10,737 miles. The MST distance for the same two density zones using the road surrogate modified dataset (*i.e.*, geocoded locations and using road surrogates for the remaining customers) is 10,498 miles. Based on this analysis, we

conclude that there is no substantial difference in dispersion using CB surrogates or road surrogates in the lowest density zones in Florida, although the HAI Model CB surrogates are slightly more conservative than using road surrogates for estimating customer locations.

Q. DO YOU CONCLUDE THAT BOTH THE CB SURROGATE METHODOLOGY USED BY THE HAI MODEL AND THE ROAD SURROGATE METHODOLOGY USED BY THE BCPM EXAGGERATE ACTUAL DISPERSION?

A. Yes. The evidence presented above demonstrates that road surrogates overstate dispersion. In addition, AT&T and MCI filed an *ex parte* presentation to the FCC on June 10, 1998, attached as Exhibit: _____ (DJW/BFP-7), that addressed these surrogate methodologies for several study areas around the country, including Florida (in summary, this presentation shows that for Florida and Kansas study areas, using road surrogates yields distribution route distances that are 5% shorter than using CB surrogates for all density zones and 5.5% shorter in the lowest two density zones). Because the CB surrogates and the road surrogates appear to result in similar dispersion (based on MST analyses), we believe that CB surrogates also overstate true dispersion. In fact, this is what one would expect from a methodology that places customers as far apart as

The Assumptions Underlying the Process Used by the BCPM to Estimate Customer Locations are Counter-Intuitive and Have Not Been Validated

Q. HAVE THE BCPM SPONSORS PROVIDED ANY VALIDATION OF THEIR CUSTOMER ALLOCATION ASSUMPTIONS?

A. No, the BCPM developers have not attempted to explain, justify, or support their assumptions that customers tend to be (1) evenly distributed to each mile of all included road types, and (2) evenly distributed along all included roads. While the HAI Model sponsors have made available granular statistical information about the success of their customer geocoding in over 468 different state/density zone geographical units across the U.S., we are unaware that BCPM has made public any analogous information about the success of its customer location process.

It certainly would be useful for BCPM to state (1) the number and percent of actual customer locations that are located along the road types that are mapped in the BCPM model; (2) a statistical measure indicating how evenly these actual customer locations are dispersed along each of these road types; (3) the number and percent of actual customer locations that are located within the "road-reduced square," i.e., the quadrants in which

the BCPM models its distribution plant; and (4) the percent of all road mileage mapped in the BCPM model that falls within the "road-reduced square" in which the BCPM models its distribution plant. The provision of these statistics on a national basis, by state, and by density zone within each state would add immensely to an informed debate over the relative merits of the BCPM's approach.

Q. TO WHAT SORT OF VALIDATION HAS THE HAI MODEL CUSTOMER LOCATION METHODOLOGY BEEN SUBJECTED?

A. The geocoding methodology utilized by the HAI Model is the result of a process that has been validated in the marketplace. The HAI Model uses Metromail's direct mail address lists for residence locations and Dun and Bradstreet's ("D&B") database for business locations. Both of these databases are commercial products that have been used in the marketplace. These databases are obtained by an independent vendor, PNR and Associates, through agreements with Metromail and D&B. PNR uses these two commercially available databases, along with a commercially available geocoding software program known as Centrus9 Desktop (distributed by QMS Software) that converts addresses into latitude and longitude coordinates. In short, all of the data used by PNR to geocode is commercially available and has been tested, and validated in the

marketplace.

The HAI Model uses Metromail and D&B data to determine actual customer geocodes because the HAI Model developers believe these to be the best current publicly available data. To the extent that BellSouth, GTE, Sprint, or other ILECs, maintain lists of addresses of the locations to which they provide telephone service -- or the actual geocodes of these locations -- one could substitute these customer geocodes into the HAI Model as alternatives to the sources it now uses. Indeed, ILECs seeking to be eligible to receive universal service support should be required to make available any data that they might have in this regard to improve the accuracy of the cost modeling process. Similarly, to the extent that the ILECs have data on the number of lines by type that are demanded by customers in each specific CB and/or wire center, ILECs that seek to be eligible to receive universal service support should be required to make any such data available to the parties to improve the accuracy of the cost modeling process.

The BCPM Results Presented by the ILECs in this Proceeding Underscore the Importance of the Process Used by the HAI Model to Accurately Determine Actual Customer Locations

Q. IN OTHER PROCEEDINGS, WITNESSES FROM INDETEC -- THE BCPM DEVELOPERS -- SEEM TO SUGGEST THAT ALTHOUGH GEOCODING MAY BE SUPERIOR CONCEPTUALLY, THIS IS OF LITTLE RELEVANCE IN USF PROCEEDINGS BECAUSE THE GEOCODING SUCCESS RATES IN RURAL AREAS ARE SO LOW. HOW DO YOU RESPOND?

A. There are several responses to this issue. First, current geocode success rates are not strictly a function of urban versus rural. Instead, they tend to be higher in medium to high density areas than they are in extremely low density areas. Thus, even in rural areas, a relatively high proportion of customers that live in towns can be successfully geocoded. This means that the HAI Model does a better job of locating clusters of customers as they occur naturally, even in rural areas.

Second, of course, is that the HAI Model's ability to locate one-third of the customers in the lowest density area of Florida is clearly superior to the BCPM, which locates no customers; and as we noted earlier, as geocoding success rates improve in lower-density areas, overall customer location in the HAI Model also will continue to improve.

As the following table demonstrates, the HAI Model geocoding success

rate is relatively high in all density zones in Florida.

Geocode Success Rates
In Florida (Residence Lines)

Density Zone	Geocode Pct.
0 – 5	34%
5 – 100	62%
100 – 200	80%
200 – 650	85%
650 – 850	84%
850 – 2550	78%
2550 – 5000	64%
5000 – 10,000	46%
10,000 +	50%

See Exhibit: _____ (DJW/BFP-6)

In its Order, the Louisiana Public Service Commission adopted the Staff's Final Recommendation which reached a conclusion that is consistent with our analysis:

> It is interesting that while according to Dr. Duffy-Deno's definition of rural, i.e., fewer than 20 housing units per square mile, 104 of BellSouth's Louisiana wire centers would be classified as rural , BellSouth's calculation of universal service support shows support for every wire center it operates in Louisiana. (Tr. 135, Martin Late-Filed Exhibit 1, BellSouth Telecommunications, Inc. Response to FCC Data Request DA 97-1433 CC Docket 96-45, August 15, 1997, Questions 9 and 19.) Thus, to the extent that the Hatfield model more accurately 'ocates customers in other high cost areas, which according to BellSouth's USF calculations all wire centers are, the Hatfield model would produce a better cost estimate of

serving these areas than the BCPM that estimates the location of customers in nonrural areas.

Based upon the evidence presented in the proceeding, Staff believes that the Hatfield approach to locating nonrural customers is superior to the BCPM's method that makes basic, but reasonable, assumptions regarding customer location. Nevertheless, the BCPM does not locate customers. The Hatfield model's preprocessing process uses Metromail data which contains addresses for 67.6% to 76% of the housing units in Louisiana as of January 14, 1998. (BST Exhibit 4, Duffy-Deno, Rebuttal, p. 6, AT&T Exhibit 1, Klick Rebuttal, p. 28, and BellSouth Comments, p. 3.) Clearly, a model that actually locates customers is more accurate than one that estimates customer locations. Louisiana Public Service Commission Staff's Final Recommendation at 7-8, March 30, 1998, footnotes deleted.

The HAI Model Accurately Identifies Actual Groupings of Customers, While the BCPM, By Using an Artificial "Grid" Overlay, Completely Fails to Do So

Q. HOW DOES THE BCPM DETERMINE THE INDIVIDUAL GEOGRAPHIC AREAS THAT THE NETWORK WILL SERVE?

> longitude and latitude rather than by principles of efficient design. Thus, BCPM would serve a hypothetical group of four adjacent households very differently depending on where those households happen to be situated in relation to the arbitrary gridlines that BCPM imposes. If entirely included in one grid, all households in the group might be assigned to a single Carrier Serving Area served by a single DLC terminal and a single placement of subfeeder cable. If, however, the same group of households "straddles" the BCPM gridlines, that group would be assigned to as many as four different CSAs, requiring four DLC terminals and four subfeeder placements. Such an anomalous result does not reflect the efficient, forward-looking design required by the FCC. (Report of the Administrative Law Judge on Selection of Cost Study, April 2, 1998, page 16, para 69)

In contrast, the HAI Model imposes no artificial geographic constraint on its serving area design within wire centers. After customers are located, the Model identifies groups of customers that can be served together logically (consistent with technological constraints) and builds efficient serving areas and outside plant to serve them. By using this approach, the HAI Model incorporates engineering judgment and economic decision-making in a manner that is fully-consistent with widely-accepted outside plant engineering standards, while the BCPM permits its artificial grid

structure to "trump" these considerations.

The superiority of the HAI Model approach was recognized by the Kentucky Commission which stated that "the Commission determined that the nature of the design of the HAI Model aligns itself with current technology which is least-cost, most efficient and reasonable. The HAI Model engineers the complete network, including the loop."[8]

Q. DOES THE BCPM'S ARBITRARY GRID APPROACH TO SERVING AREA DESIGN LEAD TO INEFFICIENT PLACEMENT OF DLC EQUIPMENT?

A. Yes. The BCPM grid approach to serving area design is arbitrary and does not consider the underlying customer location data. For example, the BCPM models 223 digital loop carriers in the state of Florida that would serve only a single household. In addition, because the BCPM bases its locations on unoccupied housing units -- not occupied households -- the BCPM models 145 additional digital loop carriers in Florida that serve *no* households. In total, the BCPM builds 368 digital loop carrier systems that serve one or fewer customers. According to Mr. Wells, outside plant engineers would not install digital loop carriers to a single occupied household. Instead, they would use more cost-effective technology to

reach these customers -- technology such as the T1 technology incorporated into the HAI Model.

Q. DOES THE BCPM UNDERTAKE ADDITIONAL MODIFICATIONS TO CUSTOMER LOCATIONS BEFORE IT BEGINS TO PERFORM ITS ENGINEERING DESIGN?

A. Yes. Once customers have been allocated to various microgrids in a CB, based upon each grid's proportion of the CB's selected road mileage, the BCPM then (1) aggregates microgrids into ultimate grids which are constrained by macrogrids, (2) divides the ultimate grid (unless it is a microgrid) into as many as four quadrants that are centered at the road centroid of the ultimate grid, (3) calculates the total area comprised within a 500-foot buffer along each side of the specified road types in each quadrant, (4) creates a square distribution area in the quadrant, with an area identical to that created by the 500-foot buffer, (5) centers the square on the "road centroid" of the quadrant, and (6) calculates the amount of required distribution plant by assuming that the quadrant's customers are evenly-distributed throughout the quadrant in square lots. Finally, the amount of connecting, backbone, and branch cable actually constructed by the BCPM process is further constrained to be no longer than the total road mileage (for selected road types) in the quadrant.

These data manipulations can effectively "move" customers far from their originally assumed locations and create additional discrepancies between the BCPM's modeled customer locations and their actual physical locations.

Q. DO YOU HAVE OTHER CONCERNS ABOUT USE OF THE GRID STRUCTURE IN THE BCPM?

A. Yes. The BCPM developers state that the BCPM macrogrid is approximately 12,000 by 14,000 feet (1/25th degree of latitude by 1/25the degree of longitude), which represents an area of approximately 6.0 square miles. A serious problem with the BCPM grid definition is that because they are defined in terms of degrees of latitude and longitude, the grids are different sizes in different parts of the country due to the curvature of the earth. The distance represented by 1/25th of a degree of latitude is 1.88 miles in Washington, compared to 2.44 miles in southern Texas, a 30 percent discrepancy. More relevant, the maximum size of the BCPM serving areas varies by more than 6% in the state of Florida alone. By defining grids in terms of degrees of latitude, the BCPM creates carrier serving areas that are substantially larger in the south than they are in the north. This is particularly troubling because MapInfo has the option of specifying a grid overlay in feet rather than in degrees. While this would

not make the underlying assumptions about "grid" design correct, it would at least permit the BCPM to be consistently applied around the country (Exhibit: _____ (DJW/BFP-8) shows this variance in grid size).

Our understanding is that a serving area can be as large as 18,000 by 18,000 feet without violating the engineering requirement that every customer in the carrier serving area be within 18,000 feet of the DLC. Of course, this would require that the DLC be placed at the geographic center of the serving area, rather than at the "road centroid" of the serving area (as currently is done in the BCPM). Enlarging the serving area to these dimensions would result in a serving area that is approximately 11.6 square miles -- 90 percent larger than the size of the average serving area utilized by the BCPM. Thus, modification of the BCPM grid structure from 1/25th of a degree of latitude and longitude to a grid structure set at 18,000 by 18,000 feet would permit a single carrier serving area (and, therefore, a single DLC) to serve more than twice as much area and, on average, twice as many customer locations in Florida.

Q. WHILE EXPANDING THE SIZE OF THE SERVING AREA WOULD THEORETICALLY ALLOW DLC EQUIPMENT TO SERVE MORE CUSTOMERS, IS THERE A CONSTRAINT ON

THE TOTAL NUMBER OF LINES THAT CAN BE SERVED BY A SINGLE PIECE OF DLC EQUIPMENT?

A. There is a constraint on the number of lines that a single piece of DLC equipment can support, and that limitation is the subject of dispute between the parties. In rural areas that are subject to universal service support, however, that constraint does not affect our assertion that the BCPM's serving areas are too small -- in fact, it helps to illustrate our point.

The BCPM developers assume that a single piece of DLC equipment can handle as many as 1,000 customer locations, based on an assertion that DLC equipment can handle a maximum of 1,344 lines. In our BCPM run for the state of Florida, however, the average serving area contains 493 lines, only 50% percent of the figure that the BCPM developers assert is the number of lines that can be served by a single piece of DLC equipment. Furthermore, the BCPM results for Florida show 11,202 ultimate grids that serve fewer than 400 lines, or 48%. This is significant, because a figure of 400 customers supposedly is used, in the BCPM preprocessing, as a minimum threshold for microgrid aggregation. Limiting the DLC equipment to a maximum of 1,000 lines also imposes unrealistic restrictions on the engineering design and many efficiencies

which we understand can be realized by utilizing a 2,016 line DLC (although the BCPM apparently was designed with the option to use a 2,016 line DLC, this option has been disregarded in the preprocessing stages of the ultimate grid development).

The combination of these flawed design criteria within the BCPM preprocessing creates serving areas that are too small and, therefore, that serve an artificially small number of customers. The number of lines in these serving areas could easily be doubled, thereby reducing the number of serving areas. This would result in lower investment in DLC electronics, feeder distribution interface ("FDI") equipment, and subfeeder cable. The HAI Model run for Florida has only 11,280 serving areas -- fewer than one-half the number of ultimate grids in the BCPM (23,156 ultimate grids) -- without violating any of the outside plant constraints required to provide basic local service. As a result, the BCPM places twice as many DLC units than does the HAI Model, significantly overstating costs to serve Florida customers.

The BCPM is Based on an Inefficient Design for Feeder and Subfeeder Facilities, Which Leads Directly to a Significant Overstatement of Costs

concentrations once main feeder distance from the wire center exceeds 10,000 feet.

Q. WHY IS IT NOT MOST EFFICIENT TO DIRECT MAIN FEEDER TOWARD CONCENTRATIONS OF POPULATION?

A. The cost of feeder and subfeeder is driven by two principal factors, *i.e.*, the amount of cable and wire (for metallic cable, this is measured in pair feet) and the amount of structure that must be installed to support the cable and wire. For copper cable, it is clear that directing main feeder toward population clusters should reduce total pair-feet of cable (however, because the main feeder split and the 'pointing' of main feeder both occur only beyond 10,000 feet from the central office, almost all of the affected cable is fiber, not copper -- as a result, very little cost savings for material is generated by pointing main feeder). For structure, however, this approach can require *more* investment than rectilinear routing.

That these can be more than mere hypothetical concerns is obvious from even a cursory review of the limited number of the BCPM maps that have been produced by the model's developers. These maps are rife with examples in which (1) the BCPM runs main feeder on a diagonal to cross a series of right-angle subfeeders, when a north south/east-west main

feeder would intersect the same subfeeder routes while traversing a shorter distance, and (2) the BCPM splits main feeder that requires numerous extremely long subfeeder runs in order to reach each of the grids. In the Minnesota USF proceeding, Mr. Morrisette -- an economist in the Minnesota Residential and Small Business Utilities Division of the Office of the Attorney General -- testified that "feeder cost in the BCPM as a percentage of the total loop cost is significantly higher than in the HM or U S WEST's RLCAP." (OAG Ex. 110 (Morrisette 1/23/98) at 8). This was part of the ALJ's rationale for concluding that "the BCPM path design methodology again tends to increase costs."[9]

These anomalies in the BCPM's feeder design arise from what we believe is a fundamental flaw in the BCPM's feeder pointing logic. In the BCPM, structure must be built to each occupied grid, whether that grid contains a single customer or thousands of customers. Unlike investment in copper cable, feeder structure investment is not (with minor exceptions) significantly affected by the number of customers in a grid or the distribution of customers between grids (unless, of course, some grids are entirely empty). As a result, attempting to minimize structure costs using a process that takes into account the assumed customer population within each grid effectively mis-specifies the optimization analysis. The result is

diagonal main feeders that would require more structure expense than would a vertical or horizontal main feeder serving the same bisecting subfeeder network.

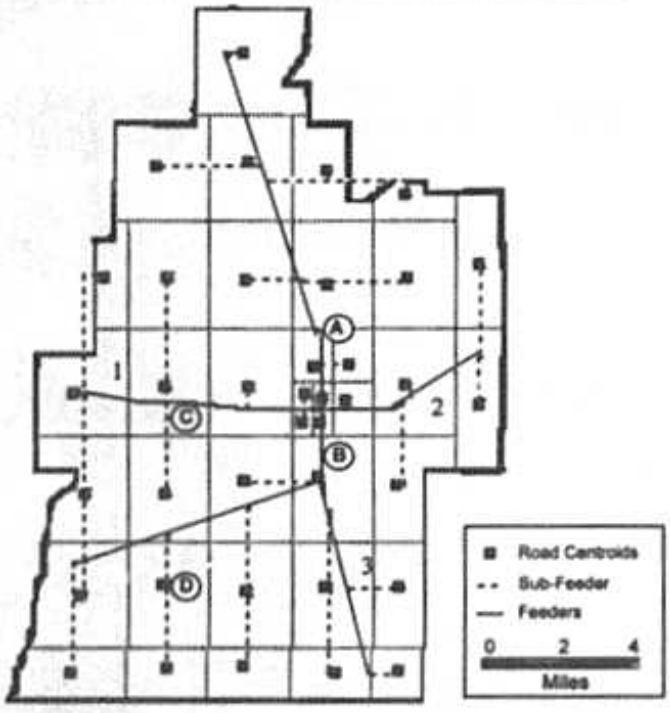
Q. APPARENTLY IN RESPONSE TO THIS CRITICISM, THE BCPM NOW SOMETIMES USES RECTILINEAR ROUTING FOR ITS FEEDER CONFIGURATION. DOES THIS SOLVE THE PROBLEM?

A. No. The BCPM still does not employ an efficient design. It simply compares two potentially inefficient designs, on a wire center basis, and chooses between them. In addition, even in situations in which the main feeder might be split efficiently, the BCPM often employs extremely long subfeeder runs in order to reach quadrants inside the "open jaw" created by splitting the feeder. This feeder plant design -- sometimes referred to as the "bush" design (to distinguish it from the tree and branch design created by rectilinear routing) -- has been found by Bellcore to be generally less-efficient than the rectilinear routing of feeder. (See Exhibit: _____ (DJW/BFP-9)).

Although the BCPM developers claim that the current version of the model selects the most efficient feeder/subfeeder routing, Figure 6.1 in

their own documentation suggests otherwise. Below, we have reproduced Figure 6.1 from page 36 of the BCPM 3.0 documentation (it is our understanding that the feeder design has not changed between the BCPM 3.0 and the BCPM 3.1, and the figure of the feeder plant for Red Oak, Iowa has been removed from the BCPM 3.1 documentation -- even though all of the other illustrations in the documentation still use Red Oak, Iowa), and superimposed three numbers indicating inefficiencies in the feeder/subfeeder routing that we wish to discuss.

Figure 6.1
Feeder Plant - Red Oak, Iowa



At location 1, the BCPM constructs westbound main feeder on a slight angle, even though main feeder moving directly west would be shorter while still crossing all of the vertical subfeeders. The same thing occurs with the eastbound main feeder at location 2. At location 3, the BCPM constructs a long southbound subfeeder off of the eastern leg of the main feeder, even though the road centroids of the two grids it serves could be reached much more efficiently by shorter horizontal subfeeder segments.

In short, the problem is that the BCPM's feeder pointing algorithms should be (1) modified to eliminate their sensitivity to customer concentration and to consider, instead, the concentration of carrier serving areas and the distance of serving areas that must be reached by the feeder, (2) modified to eliminate the "bush" feeder design when a decision is made to split main feeder, and (3) modified to determine the most efficient design on a feeder-by-feeder basis, rather than a wire center basis.

In contrast, the HAI Model appropriately (1) lets the user select whether or not to steer feeder, (2) seeks to optimize the steering by taking the cluster's distance from the central office into account, and (3) allows the user to specify an air-to-route ratio.

be geographically located far away from actual customer locations). The BCPM then builds backbone and branch cables *only within* each road-reduced quadrant assuming that all customer locations are evenly-distributed throughout the quadrant (it is important to note that the BCPM assumes that all customers -- including outlier customers that are actually located sequentially along rural roads outside of towns -- are relocated into quadrants in which they are served by backbone and branch cable, as though these customers were located in urban or suburban "tracts"; in contrast, the HAI Model identifies these outlier customers, and recognizes that road cable must be installed by the model to provide service to these customers -- just as it is in the real world). Exhibit: _____ (DJW/BFP-10), which is a graphical depiction of this process, demonstrates that the BCPM approach results in distribution areas that are too small and that can be far removed from the customer locations that are initially assumed by the BCPM.

In contrast, the HAI Model constructs its distribution plant in geographic areas that resemble the actual physical locations of customers. To facilitate modeling, the HAI Model converts each serving area into a rectangle. In doing so, however, it preserves the basic area, shape and location of the physical cluster of customers, thereby preserving the

appropriate relationship between customers and between customers and the wire center. Exhibit: _____ (DJW/BFP-10) also displays a graphical depiction of the HAI Model approach to establishing distribution areas, and contrasts the HAI Model results with those generated by the BCPM. As is obvious from Exhibit: _____ (DJW/BFP-10), the HAI Model approach results in distribution areas that match current customer demand much more closely than does the BCPM approach.

Q. IN YOUR OPINION, ARE THE HAI MODEL CLUSTERS A MORE REASONABLE DEPICTION OF WHERE CUSTOMERS ARE ACTUALLY LOCATED THAN THE BCPM ROAD-REDUCED DISTRIBUTION QUADRANTS?

A. It is clear to us that the HAI Model clusters more closely depict locations where customers are than do the BCPM square, road-reduced distribution quadrants. While it is true that the HAI Model could be modified to ensure that the underlying cluster characteristics are not limited to a North-South, East-West orientation, AT&T's and MCI's FCC filing (attached as Exhibit: _____ (DJW/BFP-7)) shows that (1) for any given study area, the maximum change in basic local service cost that would result from eliminating the North-South, East-West orientation requirement would be -0.84%, (2) the maximum upwards adjustment for the 17 study areas

would be 0.57%, (3) the average effect for all 17 study areas would be a *reduction* in basic local service cost of 0.07%. As shown in Chart 1, this change has minimal effect in Florida (less than 0.15% for any study area) with a *reduction* for all Florida companies in the lowest density zone.

In other proceedings, the BCPM proponents have claimed that the HAI Model convention of employing an aspect ratio to estimate cluster shape is appropriate only for those clusters whose longest axis is nearly North-South or East-West.[10] While we agree that limiting cluster orientation in the HAI Model to North-South, East-West is not ideal, we disagree with this assessment that use of an aspect ratio is not reasonable -- it is far superior to the distribution areas created by the BCPM, which always are square and may be geographically located far from the underlying customer locations, particularly in rural areas most likely to require USF support.

In this proceeding, one must keep in mind that the Commission must choose between two competing cost models. There are a number of reasons why we conclude that the HAI Model approach to distribution area design is superior: (1) its rectangular clusters are based on actual customer locations, while the BCPM's road-reduced distribution areas are not; (2) its rectangular cluster area is based on the actual area of the

cluster, while the BCPM limits the size of its *square* distribution areas to an area equal to an arbitrary 1,000 feet times the road distance; and (3) its rectangular cluster is located over the underlying cluster, while the road-reduced distribution area is then centered on the road-centroid of the BCPM quadrant. As Exhibit: _____ (DJW/BFP-11) illustrates, it is entirely possible that the resulting BCPM road-reduced distribution area may not contain *any* of the original BCPM customer locations (this exhibit actually provides a visual overview of the process by which we calculated the BCPM minimum spanning tree; however, it is based on an actual BCPM distribution quadrant in Texas, and illustrates that the BCPM road-reduced distribution areas often do not resemble the underlying customer locations)

Q. IS IT CORRECT, AS THE BCPM PROPONENTS OFTEN CLAIM, THAT THE HAI MODEL DATABASE DOES NOT CONTAIN ANY OF THE SPECIFIC HOUSEHOLD AND BUSINESS LOCATIONS ORIGINALLY USED IN THE HAI MODEL PREPROCESSING TO FORM THE CLUSTERS?

A. Yes, that is correct. It is equally true, however, that the BCPM does not provide or use any information about where customers are located within its microgrids. Both models in this proceeding assume that once

distribution areas are defined, customers are evenly distributed within these areas. This is necessary to ensure that the models can run in a reasonable amount of time using software that is widely available. In short, both models summarize data at the distribution area level as input to the models.

While modeling assumptions may result in some of the HAI Model locations falling outside of the rectangular clusters, and some of the BCPM locations falling outside of the BCPM road-reduced distribution areas, the HAI Model does a better job of establishing realistic distribution areas because it centers the distribution areas on customer locations and its distribution areas equal the area comprised of the actual customer locations.

Q. DOES THE BCPM SOMETIMES BUILD MORE THAN 18,000 FEET OF ANALOG COPPER CABLE BETWEEN THE CUSTOMER AND THE DIGITAL LOOP CARRIER?

A. Yes. The BCPM input data (a comma separated text, or "CSV," file that contains one record per ultimate grid) shows that the BCPM serves customers over 18,000 feet from the DLC -- meaning that under the BCPM assumptions, the customer must be served by more than 18,000

feet of copper cable. The BCPM data for Florida contains such customers. For example, the DELDFLMADSO wire center contains an ultimate grid with a feeder/distribution interface code of 2011178 (an ultimate grid within a wire center can best be identified by its "FDI Code," which is a BCPM code describing the feeder/distribution interface from which the ultimate grid is served). The lower left quadrant of this ultimate grid requires over 18,000 feet of copper distribution connecting cable, which can be verified in the BCPM input data (which shows that the horizontal and vertical connecting cable is 19,128 feet and serves six lines -- meaning that at least 19,128 feet of analog copper cable is required to connect the DLC location to the housing units in the road-reduced distribution area). In fact, the BCPM models copper analog loops in excess of 18,000 feet for Florida customers of BellSouth, Sprint and GTE. In contrast, the HAI Model has no copper analog loops over 18,000 feet, and a very small percentage of copper loops above 12,000 feet (less than 1%). Attached as Exhibit: _____ (DJW/BFP-12) is a graph illustrating the analog copper distribution loop lengths produced by the HAI Model.

Q. HOW DOES THE BCPM MODEL ACTUALLY SERVE THE CUSTOMERS IN THE LOWER LEFT QUADRANT OF THE ULTIMATE GRID IDENTIFIED WITH A FDI CODE OF 2011178?

A. Ultimately, the BCPM methodology moves the customers closer to the DLC, rather than serving the locations where the BCPM originally placed these customers. For example, the customers in Florida described above would require over 19,128 feet of copper analog connecting cable, but the BCPM actually serves these customers with only 506 feet of copper analog connecting cable. This 97 percent reduction in the amount of cable required is achieved as a result of the BCPM's approach of limiting the amount of cable in any quadrant to the number of road feet in the quadrant. In other words, the BCPM ends up constructing only 3 percent of the cable that the model previously calculated could be required to reach these customers. If one were to draw a diagram of this ultimate grid, one would observe that customers in this quadrant would not be connected to the rest of the network by the small amount of connecting cable actually built by the BCPM.

This example highlights a serious and significant problem with the BCPM -- this "capping" methodology prevents the BCPM from constructing enough plant to serve customers at the road-reduced quadrant locations where prior analytical steps in the model have placed them. In other words, the BCPM methodology does not place plant to serve these customers *either* (1) on the road to which they were originally allocated, or

(2) in the smaller road-reduced quadrants to which these customers are moved. In Florida (as shown in Exhibit: _____ (DJW/BFP-13)) the BCPM builds insufficient cable to serve the customers that are assigned to those road-reduced quadrants for about 55 percent of the road-reduced quadrants (or distribution areas). This occurs because the road mileage in these road-reduced quadrants is less than the amount of connecting, backbone and branch cable that the BCPM initially calculates is necessary to reach from the DLC location to the customers in these quadrants. This is yet another in a series of flawed BCPM assumptions that effectively "undo" the model=s initial customer assignment approach.

Q. ARE THERE OTHER FEATURES OF THE BCPM'S DISTRIBUTION DESIGN THAT ARE PROBLEMATIC?

A. Yes, the BCPM assumes that customer lots are square, rather than rectangular. This is unrealistic and leads to an overstatement of the costs for distribution plant and drops.

Q. WHY IS ASSUMING A RECTANGULAR LOT MORE APPROPRIATE THAN ASSUMING A SQUARE LOT?

A. Lot shapes generally are determined by property developers who are seeking to maximize the value of the land available for development.

Subdividing a parcel into rectangular lots, with the depth greater than the width -- as is assumed in the HAI Model -- reduces a developer's road, sidewalk, and driveway expenditures and increases the amount of salable acreage. Subdividing a parcel into square lots, as is implicit in the BCPM, would increase a developer's pavement costs, reduce the average homeowner's land area, and generate lots that would have undesirable shallow front and rear yards.

Just as square lots would require a developer to install more road feet and driveway feet per household, as shown in Exhibit: _____ (DJW/BFP-14) assuming square lots in the BCPM requires more outside plant to be installed to reach these households. Because the real estate developers should have the same incentives as the telecommunications providers, *i.e.*, to reduce infrastructure costs, the HAI Model's use of rectangular lots is the more logical modeling assumption than the BCPM's use of square lots which is not supported by any evidence and serves to overstate costs (the HAI Model does not assume rectangular lots for outlier clusters, but recognizes that these customers are located along roads).

Q. CAN YOU SUMMARIZE THE DEFICIENCIES IN THE BCPM'S OUTSIDE PLANT DESIGN?

appropriately-sized serving areas. Finally, the BCPM developers assume that all customer lots are square. Obviously, there are serious deficiencies in this portion of the BCPM, even assuming that this above process does not drop any customers, which it apparently does.

Q. CAN YOU SUMMARIZE THE EFFECTS THAT THESE DESIGN DEFICIENCIES IN THE BCPM HAVE ON THE MODEL'S OUTSIDE PLANT COSTS?

A. Yes. The BCPM creates too many serving areas (ultimate grids) by virtue of (1) a grid process that is arbitrary, and not based on the BCPM assumed customer locations; (2) its use of grid sizes that are too small to take full advantage of the ability to serve customers at up to 18 kft using copper technology; and (3) its assumption that the SAI/DLC should be placed at the road centroid of the grid, rather than at its geographic center. This, in turn, requires too much SAI/DLC equipment and too much subfeeder plant to reach the SAI/DLC in each of these undersized serving areas.

Feeder/subfeeder distances also are overstated by the BCPM's criteria for pointing main feeder and its use of the inefficient "bush" design for configuring subfeeder.

On the other hand, the amount of distribution plant needed by the BCPM can either be overstated or understated. While the "road reduction" assumptions used to create the square area within each grid where distribution plant actually is constructed in the Model may understate costs in some areas, the square lot design substantially overstates distribution costs in other areas. The combined effect of these inaccuracies is the worst of all worlds -- overstating required outside plant while still failing to reach a large number of basic local exchange customers in Florida. Clearly, the sum of these "wrongs do not make a right."

The following table shows how these general concerns manifest themselves in the BCPM run for Florida.

Table 1
Comparison of Outside Plant Statistics
For HAI Model and BCPM
For the State of Florida

	HAI Model	BCPM
1. Number of Digital Loop Carriers	10,785	18,897
2. Route Miles	183	N/A
Outlier Road	3,138	N/A
Outlier Connectors	86,981	70,635
Branch Cable	11,794	13,182
Backbone Cable	N/A	14,374
Distribution Connecting Cable	102,096	98,190
Total Distribution		
Feeder Connecting Cable	1,116	11,346
Subfeeder Cable Part 2	N/A	3,035
Subfeeder Cable	15,295	17,016
Main Feeder Cable	8,655	9,992
Total Feeder	25,066	41,390
Total Route Miles	**127,162**	**139,580**

As Table 1 indicates, the BCPM has substantially overstated the amount of DLC equipment required to efficiently reach Florida's consumers of local telecommunications service, and overstated the amount of feeder and subfeeder. However, the backbone and branch cable components of the distribution plant are significantly understated by the BCPM, demonstrating that the BCPM fails to build enough of this cable to reach

all of the customers. Overall, the BCPM has overstated the total route miles of cable and structure required by approximately 10 percent (details supporting these figures are set forth in Exhibit: _____ (DJW/BFP-15) and Exhibit: _____ (DJW/BFP-16), which compare, by company, HAI Model and the BCPM results for the state of Florida for wire centers included in both models).

In addition, the feeder portion of the BCPM network is significantly greater than the HAI Model feeder route miles. As Exhibit: _____ (DJW/BFP-17) illustrates, per-foot structure costs associated with the feeder portion of the network are substantially more expensive than the structure associated with the distribution portion of the network, due largely to the different mix of structure (e.g. aerial, buried, and underground) between feeder and distribution. By using excessively small serving areas in the BCPM methodology, the BCPM developers have overstated investment both by placing excessive DLC equipment and by artificially shifting the mix of structure from distribution to the more expensive structure mix associated with feeder plant.

Q. WHAT ARE THE IMPLICATIONS OF THESE COMPARISONS?

A. The obvious implication is that even if comparable inputs were used in the

two models, the BCPM would overstate the cost of universal service in Florida. In short, the Commission should not focus exclusively on inputs -- choosing the appropriate cost proxy model does matter, and will affect the costing results.

Q. HAVE OTHER REGULATORY AGENCIES COMPARED THE CUSTOMER LOCATION AND ENGINEERING DESIGN ASPECTS OF THE HAI AND THE BCPM MODELS?

A. Yes. The Louisiana Public Service Commission, the Kentucky Public Service Commission, and the Minnesota Public Utilities Commission all found the customer location and outside plant engineering assumptions in the HAI Model superior to those employed by the BCPM.

Q. IN OTHER JURISDICTIONS, THE BCPM SPONSORS HAVE CONTENDED THAT APPLICATION OF A MINIMUM SPANNING TREE ANALYSIS HAS DEMONSTRATED THAT THE HAI MODEL FAILS TO BUILD SUFFICIENT DISTRIBUTION PLANT. IS THE MST DISTANCE A VALID BASIS FOR ASSERTING A GENERALIZED CLAIM THAT THE HAI MODEL BUILDS TOO LITTLE CABLE?

A. No, this claim is misleading. The BCPM proponents are using the MST

distance (which we described earlier) as a validity check on the HAI Model. However, their claims are exaggerated and based on partial information.

The claim that a MST should be the *minimum* amount of distribution cable installed in a cluster also is wrong for at least two important reasons. First, the issues raised by this claim tend to be most pronounced in sparsely populated clusters, precisely those clusters in which the HAI Model is most likely to place a high proportion of customers -- those that are non geocodeable -- on CB boundaries. As noted earlier, this approach (placing surrogate locations on the CB boundaries) tends to disperse customers too widely and, therefore, overstates the amount of cable required (*see,* for example, AT&T/MCI Ex Parte filing of June 10, 1998, *HAI Model v 5.0a, Why It Engineers the Appropriate Amount of Distribution Plant*, slide 15). Thus, any MST distance calculated by the BCPM sponsors, based on these overly-dispersed surrogate locations, will likely *overstate* the minimum amount of cable that would be required to serve these customers where they actually are located.

In addition, the BCPM sponsors have conceded in other jurisdictions (*e.g.*, Minnesota and Texas) that the Steiner tree, not the MST, constitutes the minimum distance required to connect a series of points in a network --

that the MST can overstate the minimum amount of cable required by as much as 13 percent.

A third conceptual issue with the MST analyses that have been undertaken to date by the BCPM sponsors is that they do not include the digital loop carrier ("DLC") and feeder/distribution interfaces as nodes that must be connected by any MST or Steiner tree. To create a functional network, it is obvious that the various customer locations in a distribution area must be connected not only to each other, but to the rest of the network as well. Because this connection takes place through the DLC and/or FDI nodes, these locations could have been included as part of the MST calculation -- failure to do so can understate the required MST distance. However, in order to minimize potential differences between the parties' presentations, the MST analyses that we provide with this testimony also *excludes* the DLC/FDI nodes from the calculations, consistent with the approach used by the BCPM proponents.

Q. ARE THERE "BOTTOM LINE" WAYS OF DEMONSTRATING THAT THE PROBLEMS CITED BY THE BCPM SPONSORS ARE NOT SIGNIFICANT?

A. Yes. One way of demonstrating the adequacy of the HAI Model's

produced approximately 18 percent *more* backbone and branch cable than did the BCPM. The HAI Model produced more backbone and branch cable than did the BCPM for 382 of the 470 wire centers studied (or 81%). In short, the HAI Model constructs significantly more cable to reach customers in the distribution areas than does the BCPM -- a fact that is inconsistent with claims made by the BCPM sponsors that the HAI Model fails to construct sufficient cable to "connect the dots" in distribution areas (for the reasons articulated earlier, we believe that the appropriate comparison of the two models is a comparison of backbone and branch cable; however, a comparison of *all* distribution cable also confirms that the HAI Model constructs sufficient cable. *See* Exhibit: _____ (DJW/BFP-16)).

Q. HOW ARE THE MST ANALYSES THAT YOU ARE PRESENTING ORGANIZED?

A. We have performed a MST analysis for a subset of BellSouth wire centers in Florida -- the wire centers for which we have been provided both the HAI Model MST distances and the BCPM microgrid data. The MST analyses described below are based on 124 BellSouth wire centers (these 124 wire centers represent all wire centers that matched up with BellSouth's initial data response, with the following exceptions: (1) we

analyses on both models, not just on the HAI Model analysis.

Q. HOW DO THE BCPM CUSTOMER LOCATION ASSUMPTIONS AFFECT THE MST ANALYSES?

A. As we have discussed above, the BCPM does not actually locate customers. Instead, it allocates CB population data to arbitrarily-designated microgrids that are overlaid on each wire center, based on relative road distance. Unfortunately, this forces an analyst to make assumptions regarding the BCPM's customer location assumptions in order to conduct a MST analysis (which is designed, after all, to connect individual customer locations).

The problems caused by the BCPM customer location assumptions are particularly acute in low density areas because population is sparse and CBs are geographically large, covering numerous microgrids (which are 1,500 feet by 1,700 feet in size). Under the BCPM approach, in which a CB's customers are distributed to all microgrids that have qualifying road types traversing them, the small number of customers in a CB are allocated to a large amount of road mileage, resulting in many microgrids with fractional customer allocations. Even microgrids that are allocated more than a single customer contain fractional customers, and *none* of

these customers are physically located by the BCPM at any specific point within the microgrid. Thus, if a MST analysis on the BCPM is to be conducted at all, the analyst must determine (1) how to include microgrids with only a fraction of a customer, and (2) where to geographically locate whatever customers the BCPM has allocated to each microgrid.

With regard to microgrids containing only a fraction of a customer, we have employed an algorithm that totals all fractional customers in the microgrids comprising a quadrant, and then allocates this number of customers to a portion of the quadrant's microgrids from which these fractional customers are drawn. This approach is conservative, because it tends to concentrate customers that the BCPM would otherwise disperse over a larger number of microgrids. For example, the BCPM process for calculating the amount of distribution plant that must be constructed is based on a 500-foot buffer on either side of all included road feet in all populated microgrids, even if a microgrid is occupied by only a fraction of a customer. The total area generated by this road buffer ultimately is divided by the number of customers in these microgrids to generate the average lot size, which in turn determines the drop length that is calculated by the model. Comparing the amount of distribution plant generated by the BCPM, including drop lengths, to our MST distances -- which

implicitly assume smaller lot sizes -- is quite conservative, because it improves the chances that the BCPM will pass the MST test (the MST analyses that we have undertaken for the BCPM data focuses on microgrids, because these are the geographic entities to which the BCPM model allocates customers for basic local exchange service. BCPM 3.1 Model Methodology, Section 5.3.4, at 28-29).

Having made that decision, we then had to address where in the microgrid we would physically locate each of the allocated customers. We decided to assume, for MST purposes, that all customers assigned to a microgrid are evenly distributed throughout a road-reduced area of the microgrid. This approach is consistent with the assumptions made by the BCPM in designing distribution plant within quadrants. These assumptions are that (1) the area served equals 1,000 feet times the amount of road distance in the microgrid, with a maximum area equal to the area of the microgrid, (2) customers are evenly distributed throughout the area served, (3) lots are square, and (4) housing units are located in the center of lots. Exhibit: _____ (DJW/BFP-11) provides a visual representation of this process.

Q. HOW DOES YOUR MST ANALYSIS COMPARE WITH THE MST ANALYSES PREVIOUSLY PERFORMED BY THE BCPM

PROPONENTS?

A. Prior MST analyses on the HAI Model -- and criticisms made of the HAI Model based on these analyses -- were performed at the distribution area level. In other words, comparing the MST distance for customer locations *within* a given distribution area to the plant estimated by the HAI Model *within* a given distribution area. For reasons we have discussed previously, and will restate below, this is not an appropriate internal consistency check on the HAI Model or the BCPM. However, it is important to recognize that the BCPM proponents have not performed the MST test for the HAI Model at the serving area level or at the wire center level.

In addition, the MST analyses that have been conducted by the BCPM proponents for the BCPM have been inconsistent with the analyses they have undertaken for the HAI Model.

Q. HOW HAVE THE MST ANALYSES ON THE BCPM CONDUCTED BY THE BCPM PROPONENTS DIFFERED FROM THEIR MST ANALYSES On THE HAI MODEL?

A. In prior proceedings in Minnesota, Texas and Washington, the MST analyses conducted by the BCPM proponents for the BCPM have included

all cable within a *serving area* (*i.e.* cable *connecting* the distribution areas within the BCPM serving areas), while the MST analyses that the BCPM proponents have performed for the HAI Model have not included all such cable. To be consistent with the way in which BellSouth asked PNR to conduct the MST analysis of the HAI Model for this proceeding, the MST analysis of the BCPM should compare only the customer locations *within* a distribution area to the distance modeled by the BCPM *within* the same distribution area. We have conducted our MST studies of the two models consistently -- our expectation is that the BCPM proponents will not.

Q. WHAT ARE THE RESULTS OF YOUR ANALYSES?

A. The results of our MST analyses for the 124 Bell South wire centers are summarized by density zone in Exhibit: _____ (DJW/BFP-18) and are summarized by wire center in Exhibit: _____ (DJW/BFP-19). The analyses show that for the lowest density zone, the HAI Model estimated distance falls 24 percent short of the MST distance, while the BCPM estimated distance falls more than 38 percent short of the MST distance.

For the next lowest density zone, the HAI Model distance actually *exceeds* the MST distance by more than 30 percent while the BCPM exceeds the MST distance by only 13 percent. For the lowest two density zones

Importantly, the MST is not a validation (because it is not based on actual data) but a check on the assumptions within a model. If one recognizes that the MST distance is likely to be overstated in the lowest density zone -- due to the use of the HAI Model surrogate location approach -- then one may nevertheless conclude that the HAI Model builds sufficient plant in this density zone. When one also considers that the Steiner tree distance, not the MST distance, is the minimum distance necessary to connect a group of points, the relevance of the MST analyses proposed by the BCPM proponents is further diminished.

In summary, all of the evidence we have produced establishes that the HAI Model does a better job of building sufficient plant to reach Florida customers where they are actually located, without overbuilding the subfeeder network and the DLC system required to reach those customers.

VI. THE INPUTS TO THE BCPM USED BY THE INCUMBENT LOCAL EXCHANGE COMPANIES CAUSE A FURTHER OVERSTATEMENT OF THE COSTS THAT WOULD BE INCURRED BY AN EFFICIENT CARRIER

Q. HOW SHOULD THE INPUTS TO A COST PROXY MODEL BE CHOSEN?

A. The determination of the "total forward looking cost... of providing basic local telecommunications service" as required by F. S. 364.025 (4) (b) is a two step process. First, the cost model to be used must be constructed in such a way that generally accepted design and placement principles and the most recent commercially available technology and equipment are used to model the characteristics of a network that would be deployed by an efficient provider of local telecommunications services. The second step is a determination of the investment that will be required and the ongoing expenses that will be incurred to own and operate such a network. In order to complete this second step, assumptions must be made regarding the acquisition costs of material and labor, the level of operating expenses, the level of capital related costs, certain operational characteristics of the network (the level of utilization of investments, for example), and the opportunities that may exist to reduce total costs by sharing investments or expenses with other firms.

Previous sections of this testimony have focused on the first step of determining the characteristics of the network required to provide local telecommunications service in a given geographic area. This section

focuses on a fundamental conceptual disagreement between the parties to this proceeding regarding the implementation of this second step in cost determination. This fundamental conceptual disagreement results in the selection of model inputs with significantly different values, which in turn has a direct and significant impact on the total cost of basic local telecommunications service calculated.

Q. DON'T ALL COMPANIES AGREE THAT THE COSTS TO BE CALCULATED ARE THOSE THAT WOULD BE INCURRED BY AN "EFFICIENT CARRIER"?

A. Ultimately, no. While witnesses for BellSouth and Sprint pay lip service to such a standard, they then go on in an attempt to justify model inputs that are based on the historic, embedded characteristics of their existing operations. In order to ascertain the reason for a significant portion of the difference in total cost of basic local telecommunications service calculated by the different companies, it is essential that the Commission look beyond the conceptual labels being placed on model inputs.

BellSouth witness Caldwell, for example, states that the cost model adopted by the Commission in this proceeding should be used "with the appropriate inputs to identify the costs that an efficient provider would

Q. DO YOU AGREE WITH BELLSOUTH'S AND SPRINT'S APPLICATION OF THEIR STATED COST STANDARD WHEN SELECTING MODEL INPUTS?

A. Absolutely not. Again, this is an area where the Commission must look behind the high-level terminology in order to determine what these companies actually mean.

The first fundamental mistake that BellSouth and Sprint have made is to confuse costs which are specific to a given geographic service area with costs that are constrained by the historic characteristics of the incumbent LEC that serves the area. If properly calculated, costs that are specific to a given area reflect the unique set of characteristics of the area that in turn cause a unique set of costs. Any efficient carrier serving this area would be expected to have a similar experience: the costs would continue to be unique to the characteristics of the geographic area, but would not be expected to vary by carrier (by definition, an efficient carrier would be able to duplicate a comparable low cost "solution" for a given geographic "problem"). As a result, it is not necessary to go beyond a "geographic area specific" cost to a "company specific" cost, unless the objective is to include costs that are currently being experienced by the incumbent LEC that are in excess of those that would be experienced by an efficient carrier.

Q. DO THE BELLSOUTH AND SPRINT WITNESSES ARGUE FOR THE INCLUSION OF SUCH "COMPANY SPECIFIC" COSTS?

A. Yes. After correctly noting that "the primary purpose of the model is to develop deaveraged cost estimates by geographic area," Sprint witness Dickerson goes on to argue that model inputs should be specific to the company currently providing the service.[13] BellSouth witness Caldwell makes a similar flawed argument, stating that input values should be company specific, and that BellSouth's inputs to the BCPM reflect the costs that BellSouth "will incur."[14]

The use of such "company specific" inputs is inconsistent with the objective of including only the costs that an efficient new provider would incur on a going-forward basis to serve a given area. Properly calculated costs are specific to the unique characteristics of the area being served, but it is not necessary to study the historic and embedded costs of the incumbent provider in order to make an objective determination of the costs that an efficient new provider would incur to serve the area. To the contrary, by focusing on the historic operations of the incumbent LEC instead of the characteristics of the area, it becomes more difficult to make the required objective determination of costs.

Q. THE USE OF HISTORIC AND EMBEDDED (I. E. "COMPANY SPECIFIC") INFORMATION AS COST MODEL INPUTS WOULD SERVE TO OVERSTATE COSTS ONLY IF CHANGE IN THE INDUSTRY IS OCCURRING AT A SUFFICIENT PACE TO MAKE PAST CONDITIONS A POOR INDICATOR OF THE FUTURE. IS THIS THE CASE?

A. Yes. First and foremost, the position of the BellSouth and Sprint witnesses completely ignores the development of competition for basic local telecommunications services that is beginning to occur in Florida. Their arguments for the use of "company specific" inputs are nothing more than a thinly veiled attempt to carry costs that were incurred during a period of monopoly operation forward into a competitive environment. Doing so would clearly benefit the incumbent LECs, but would be directly at odds with the interests of Florida consumers of basic local telecommunications services.

The specifics of many of the industry changes are described in the testimony of Sprint witness Dr. Staihr. He correctly points out at page 9 that "historical or book costs reported over many years do not reflect the efficiencies that can be realized today in the provision of basic service. They also do not reflect the realities of today's market with regard to, for

reasons. First, BellSouth operates as a regulated monopoly; it does not yet face effective competition for its services. This Commission has not recently performed an investigation of BellSouth's operations and found the Company to be as efficient as it would be if operated in competitive markets; similarly, competitive market forces have not had the opportunity to act on BellSouth in order to provide market incentives for efficiency. In short, there is no basis for a conclusion that BellSouth could not operate more efficiently than it does today.

Second, while she has had a distinguished career at BellSouth, Ms. Caldwell's professional experience is limited to examinations of the costs of a regulated monopoly; she does not have comparable experience evaluating the costs of a firm operating in competitive markets. As a result, she simply lacks the necessary foundation to reach her oft-stated conclusion that BellSouth's existing cost structure is equal to the cost structure of an efficient provider on a going forward basis.

Q. YOU STATED THAT COSTS SHOULD BE SPECIFIC TO THE GEOGRAPHIC AREA BEING STUDIED. IT IS NECESSARY FOR ALL MODEL INPUTS TO BE CHANGED TO FLORIDA-SPECIFIC VALUES IN ORDER TO ACCOMPLISH THIS

OBJECTIVE?

A. No. In a further attempt to justify the use of historic and embedded (i. e. "Company specific") information as cost model inputs, the incumbent LEC witnesses have attempted to frame the debate as a choice between "state-specific" and "default" input values. In this dichotomy, "state specific" is simply a euphemism for historic information from the Company's records. The objective of the process should be to produce costs that are specific to a given area. In order to do so, it will be necessary to use a mixture of geographic and input data that is highly specific to the geographic area being studied (soil type, for example) and input values that are not specific to the geographic area or even to the state (the purchase price of materials that BellSouth purchases on a regional basis, for example). As Sprint witness Staihr correctly points out at page 13, "just as the values of certain inputs should and will change from location to location, others will not."

As a result, it is necessary to evaluate all model inputs in order to determine whether they are representative of the costs that would be incurred by an efficient provider. Much of this information must be specific to the area being studied. In many cases, however, so-called "default" data represents the most reliable and objective information, while so-called "company specific" inputs are based on high cost practices that

would not be sustainable in a competitive marketplace.

ILEC Inputs are Not based on a Long-Run, Forward-Looking Environment

Q. HOW DO THE FILL FACTORS, OR PAIRS PER HOUSEHOLD, PROPOSED BY THE ILEC'S IN THIS PROCEEDING OVERSTATE COSTS?

A. The models before this Commission reflect a "snapshot" of the network, calculating the cost per unit of demand (e.g., cost per loop or cost per minute of use) assuming -- as the denominator in that calculation -- today's demand. However, the plant investments (based on the fill factors, or pairs per household, utilized by BellSouth, GTE, and Sprint) are designed to provide service to today's demand plus additional demand in the future. It is important to either (1) remove this spare capacity for growth from the investment calculations by utilizing objective fill factors, or (2) take this growth in demand into account in the denominator of the cost per unit of demand to avoid overstating costs, which would lead to an over-recovery of capital costs by the ILECs. Essentially, the long-run growth implications need to be taken into account in *both* the numerator and the denominator, or removed from *both* the numerator and denominator.

meeting increasing environmental constraints;

2) U. S. computer chip makers have embarked on a joint effort to create smaller chips by using obsolete U. S. Government bomb facilities (Washington Post, 9/11/97 business section);

3) TeleWest, a joint venture between U S WEST and TeleCommunications, Inc. ("TCI") in the United Kingdom, combines telephone and cable service to achieve substantial cost savings. A discussion of the network structure, on page 3 of U S WEST's January 1993 Investors Report, states that:

> TeleWest is installing an advanced hybrid network that includes twisted copper pairs, fiber optics and coaxial cable. This is a state-of-the-art cable TV network with fiber to nodes serving 2,000 homes and coaxial cable extending beyond to nodes and into the homes. Laid along side the cable TV network is the latest telephone digital loop carrier network, which runs fiber to the nodes serving 500 homes. Copper wire extends beyond the nodes and into the homes. As shown below, the two networks overlay each other, sharing a common power supply, conduit and trench.

4) Airports and ocean ports, in which companies that compete fiercely

with each other share large portions of their fixed investment (Shopping centers and industrial parks are examples of this phenomenon, as well);

5) "Piggybacking," the practice of shipping truck trailers and containers by railroad, enables two very competitive industries - railroads and long-haul trucking (both of these industries are particularly instructive because they, too, have extensive 'networks' and have similarly made the transition from the monopoly to competitive environments) - to reduce costs by sharing infrastructure;

6) Multiple railroads form switching and terminal companies to permit structure sharing in major urban areas. There also is increasing use of trackage rights agreements, haulage agreements, and other arrangements that permit two or more railroads to compete while using the same right-of-way and facilities (the interstate highway system and the air traffic control system are other examples of structure sharing).

These are just a few of the ways in which competitors are pooling resources and sharing facilities and talent to provide better quality services to customers and to lower products' costs.

It is also important to consider how a telephone company can share structure placed today, even if no other party requires such facilities now. First, ILECs routinely place extra conduit, which is a way of sharing today's facilities with itself in the future. According to the FCC regulations, the ILECs must allow competitive local exchange carriers to share those facilities. In addition, an ILEC can lease the conduit to cable, Internet, or other services in the future (or, for that matter, lease structure itself from other network industries). Both of these are forms of sharing that do not require all companies to be ready to share the capacity at precisely the moment it is installed, but serve to substantially reduce the cost of building a network. In fact, ILECs engage in such sharing today, leasing conduit and pole attachments to and from other entities. These revenues are typically - and incorrectly - not included in the ILECs' estimation of costs. From our viewpoint, "cash is cash" and leased facilities reduce costs, improving the firm's competitive position.

VII. THE BCPM SPONSORS TYPICALLY RELY ON A BIASED AND ONE-SIDED CRITIQUE OF THE HAI MODEL

The BCPM Sponsors have Sought to Draw a Series of Misleading and Inaccurate Comparisons Between the BCPM and the HAI Model

Q. WHAT ARE THE INACCURATE STATISTICS RELATING TO THE METROMAIL DATABASE THAT ARE CITED BY THE BCPM SPONSORS?

A. In order to suggest that the HAI Model's customer location algorithm is flawed, the BCPM sponsors claim that Metromail's National Consumer Database ("NCDB") contains only 70 million named and unnamed address records for the 50 states (65 percent of the addresses). This assertion is simply wrong. Attached, as Exhibit: _____ (DJW/BFP-20), is a memorandum from Kevin Wiesep of Metromail refuting the BCPM sponsors statistics. In his memorandum -- which was filed by AT&T/MCI with the FCC in CC Docket No. 96-45 in December, 1997 -- Mr. Wiesep states that "[t]he Metromail database does have over 90% (approximately 91.5%) of the residential addresses in the U.S." Of this 91.5%, the Centrus8 Desktop software used in the HAI Model customer location process successfully geocodes approximately 71% of the residences nationally.

In contrast, the BCPM process cannot identify the actual physical location of a single customer. These sorts of statistics are most meaningful only in comparison to comparable statistics for the other models before the Commission. As we noted earlier, it would be useful for the BCPM

proponents to provide statistics for Florida identifying (a) the number and percent of actual customer locations that are located along the roads that are mapped in their runs of the BCPM; (b) statistical measures indicating how evenly distributed these actual customer locations are along the road types employed by the BCPM; (c) the number and percent of actual customer locations that are located within the "road-reduced" quadrants that the BCPM uses to represent the areas that must be served by distribution plant; and (d) the percent of all road mileage mapped in the BCPM model that falls within the "road-reduced" quadrants that the BCPM uses to represent the areas that must be served by distribution plant. The provision of these statistics for Florida, and by density zone within the state, would permit a meaningful comparison of the relative merits of the two models.

Q. IN WHAT OTHER WAYS HAVE THE BCPM SPONSORS MADE MISLEADING COMPARISONS REGARDING THE HAI MODEL?

A. In past proceedings, the BCPM proponents have attempted to use satellite observations from only one or two wire centers in an effort to disparage the HAI Model location process. However, there are several threshold problems with the method of validation used by the BCPM proponents. First, the selection of the wire centers analyzed by the BCPM proponents

In addition, I have restated the correlation analyses for both Kentucky and Tennessee (for proceedings in those states) and found that the HAI Model more accurately locates customers than does the BCPM, even in the wire centers that were hand-selected by the BCPM proponents.

Q. WHAT ARE YOUR CONCLUSIONS ON THE RELATIVE MERITS OF THE COMPETING METHODOLOGIES USED BY THE BCPM AND THE HAI MODEL TO LOCATE CUSTOMERS?

A. The BCPM proponents' main criticism of the HAI Model appears to be that geocoding is not particularly successful in rural areas, and they use a series of misleading statistics in an effort to create the impression that BCPM is superior to the HAI Model, even though the BCPM does not locate any customers at all. In addition, the BCPM proponents claim that the HAI Model does not build adequate plant to reach customers within a distribution area when, in fact, the HAI Model constructs more plant within distribution areas than the BCPM. In short, there is evidence that the HAI Model does a better job than the BCPM at predicting customer locations in rural areas, and the Louisiana Staff is correct when they assert that there is "no conclusive evidence that the BCPM does a better job of predicting customer location in rural areas than the Hatfield Model."[17]

Q. HAVE THE BCPM DEVELOPERS TYPICALLY RELIED ON A ONE-SIDED CRITIQUE OF THE HAI MODEL?

A. Yes. The BCPM proponents only appear to identify corrections to the HAI Model that would serve to increase costs. However, the HAI Model does not account for deferred taxes -- while the BCPM does.

Attached, as Exhibit: _____ (DJW/BFP-21), is a simple comparison of annual charge factors resulting from the HAI Model and the BCPM, using consistent input assumptions for taxes, cost of capital, economic life, and salvage values. This shows that the HAI Model, by not incorporating the benefits of deferred taxes, produces annual capital costs that are more than fifteen percent higher than those produced by the BCPM when consistent inputs are used.

We find it curious that the BCPM developers, after examining the HAI Model in some detail, have never pointed out this discrepancy in methodology -- a discrepancy that would serve to lower the HAI Model estimated costs and the amount of USF support.

VIII. FINDINGS AND CONCLUSIONS

Q. WHAT CONCLUSIONS CAN BE DRAWN REGARDING THE BCPM AND ITS USEFULNESS IN ESTIMATING THE UNIVERSAL SERVICE FUND REQUIREMENTS?

A. In choosing a cost model that will be the basis for estimating the universal service fund requirements, it is important that accurate estimates be developed on a geographically deaveraged basis without using excessively small geographic units that would lead to a false sense of precision. To this end, it is essential to use the most accurate data available.

Following is a summary of the problems with the BCPM:

1) The BCPM does not locate any customers.

   a) The BCPM does use geocoded data.

   b) The BCPM drops customers and therefore does not provide universal service.

   c) The BCPM assumes that all customers are evenly distributed along a selected subset of roads without any evidence supporting that assumption -- an assumption that overstates dispersion.

2) The BCPM distribution areas are unrealistic.

   a) The BCPM assumption that all distribution areas are square

is overly-simplistic.

b) The BCPM assumption that the area of the road-reduced square equals 1,000 feet times the road length is unsupported and arbitrary.

c) The BCPM road-cap leaves many customers unserved by a workable network.

d) The BCPM assumption that customers live on square lots is unsupported and overstates costs.

3) The BCPM carrier serving area design is inefficient.

a) The BCPM "cookie cutter" approach is arbitrary, and does not take into account actual customer clustering.

b) The BCPM serving areas are too small to efficiently use DLC.

c) The BCPM grid approach inconsistently treats various parts of the country.

4) The BCPM does not use a least-cost feeder plant design.

a) The BCPM mis-specifies the cost-minimizing optimization algorithm by steering feeder toward the population centroid.

b) The BCPM subfeeder cable is not always perpendicular to the main feeder.

documented and readily-adjustable;

5) develops costs for both UNEs and USF on a consistent basis;

6) includes a forward-looking and long-run perspective; and

6) satisfies the FCC criteria and F. S. 364.025 (4) (b).

We urge the Commission to evaluate the cost proxy models proposed by the parties with the understanding that similar inputs generally can be used in either model. Contrary to the past testimony of many ILEC witnesses, which has focused on model inputs, the deficiencies of the BCPM demonstrate that the methodology does matter. The substantive flaws that have been identified in the BCPM overstate costs and are difficult to modify. The HAI Model does not suffer from these same deficiencies, and is clearly the more reliable model.

Q. ARE THERE OTHER CONSIDERATIONS THIS COMMISSION SHOULD TAKE INTO ACCOUNT WHEN SELECTING A METHODOLOGY FOR THE DETERMINATION OF UNIVERSAL SUPPORT FUNDING?

A. Yes. In addition to the fact that the HAI Model actually locates customers and designs its outside plant based on the locations of the customers, the HAI Model relies on a process which will only improve as geocoding

[7] The Associated Press, "Assessment Sought on Bell Rates," Thursday, August 20, 1998.

[8] Kentucky Public Commission Order, May 22, 1998, Page 10

[9] Commission Order adopting the Report of the Administrative Law Judge on Selection of Cost Study, April 2, 1998, page 19, para. 82.

[10] Response Testimony of Dr. Duffy-Deno, Docket No. UT-980311(a), August 3, 1998, Page 27.

[11] Direct Testimony of Caldwell, Docket No. 980696-TP, August 3, 1998, Page 4.

[12] Direct Testimony of Dickerson, Docket No. 980696-TP, August 3, 1998, Page 4.

[13] *Id.* at 4-5.

[14] Direct Testimony of Caldwell, Docket No. 980696-TP, August 3, 1998, Pages 5, 17.

[15] *Id.* at 5, 10, and 17.

[16] Staff's Final Recommendation, March 27, 1998, page 11.

[17] *Id.*

MR. LAMOUREUX: They are available for cross-examination.

CHAIRMAN JOHNSON: Okay. BellSouth.

MR. CARVER: If we could, we'd like for GTE to go first.

CHAIRMAN JOHNSON: Okay. Mr. Williams.

MR. CARVER: Thank you.

MR. WILLIAMS: Thank you very much, Madam Chairman.

CROSS-EXAMINATION

BY MR. WILLIAMS:

Q Let me start with Mr. Wood, if I could, to clear up an area that we had yesterday. I'd asked Mr. Wood if he would accept, subject to check, the cost, the UNE cost for the loop in Hatfield 2.2.2., and as well as the cost for GTE and what comes out of 5.0a.

And I gave you those documents, Mr. Wood, and can you confirm the accuracy of what we were talking about yesterday?

A (Witness Wood) My numbers are two cents off of your numbers, but I think they are very close and I would call those comparable to being correct; yes.

Q Okay. And so we can agree that Hatfield 5.0a provides loop costs, total loop costs for the state of Florida for GTE of approximately $2 less than the last time

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we were here and considering version 2.2.2?

A (Witness Wood) That's right. That is the area wide average cost for a unbundled loop; that's right.

Q All right. Thank you. I am confused as to who to --

COMMISSIONER CLARK: I'm sorry. When you say area wide, you mean GTE's area?

A (Witness Wood) Yes, ma'am.

BY MR. WILLIAMS (Continuing):

Q Now you have your rebuttal testimony in front of you, both of you?

A (Witness Wood) Yes.

(Witness Pitkin) Yes.

Q And I wanted to start by directing your attention to page 12. And I'm not sure who is responsible for this portion of the testimony, so I need a volunteer. Is that you, Mr. Pitkin?

A (Witness Pitkin) I believe it depends on the specific question.

Q The specific question goes to the following statements: That the states of Hawaii and Nevada have also concluded that the HAI Model is superior to the BCPM.

A (Witness Wood) Yes. I'll take those.

Q You want that one?

A (Witness Wood) Sure.

Q I was surprised in reviewing that because I recall being in Hawaii last year, obviously unsuccessfully, and I don't recall any discussion there about the BCPM.

Are you certain that BCPM was considered by the Hawaii Commission?

A (Witness Wood) I am certain that the Hawaii Commission sent to the FCC as its proposed cost model the HAI Model, the Hatfield Model.

Q Right. That wasn't my question. It says right here that the state of Hawaii concluded that Hatfield was superior to BCPM.

A (Witness Wood) I see. And, actually, I agree with you, Mr. Williams: That is poorly stated with regard to Hawaii because that state was unusual in that it wasn't these two models going head to head. That's --

Q BCPM was not even an issue in Hawaii; was it?

A (Witness Wood) That sentence should accurately read that the state of Hawaii has found the HAI Model to be the correct model for calculating universal service costs and has recommended the model to the FCC as its chosen model platform.

Q Right.

A (Witness Wood) That's right.

Q My question is real simple, Mr. Wood: BCPM was not even an issue in Hawaii; was it?

A (Witness Wood) That's right.

Q Okay. And, similarly, BCPM was not even an issue in Nevada? In fact, it was a predecessor version to BCPM; isn't that correct?

A (Witness Wood) I'm not sure.

Q It was BCPM 2 that was at issue in Nevada; was it not?

A (Witness Wood) Yes. And I think also it was earlier versions of both models competing in Nevada.

Obviously, depending on the timing of the case, it's going to be an earlier version of each model versus a later case that has a later version.

Q Uh-huh. Now could you turn to page 20 of your testimony. And I'm assuming this is Mr. Pitkin.

There's a question that says, "Why do you" -- This is at the top of page 20. "Why do you contend that the resulting BCPM network is not capable of providing universal service?" Do you see that question?

A (Witness Pitkin) I'm sorry; the middle of that question: "Why do you contend that the resulting BCPM network is not capable of providing universal service?"

Yes.

Q Right. And am I correct in assuming, Mr. Pitkin, that your opinion is that the BCPM model is not capable of providing universal service?

A (Witness Pitkin) Yes.

Q All right. Your testimony is that it's not capable and not that it is just the inferior model to Hatfield?

A (Witness Pitkin) That's correct. My contention is that the BCPM drops customers and, therefore, the BCPM cannot provide service to all the customers that the model says it should provide service to.

Q And your testimony is that Hatfield does not drop any customers?

A (Witness Pitkin) Yes.

Q Okay. Now the reason that you give, at least in this answer, as to why BCPM is not capable of providing universal service is that BCPM builds to housing units whereas Hatfield builds to households; do you see that there?

A (Witness Pitkin) That is not my contention as to why that BCPM does not provide universal service. That section is some information that I use later in my discussion.

My contention is that the BCPM methodology allocates fractional customers to microgrids. And, therefore, if you have many microgrids in an ultimate grid, each with a small fraction of a customer, when you aggregate them up and do the rounding process that the BCPM

Model does and Dr. Staihr has testified to, then the BCPM drops those customers.

Q I see. So the incapability of BCPM does not have anything to do as suggested by this answer with the difference between household and housing units?

A (Witness Pitkin) The answer says it is clear that some of these customers are dropped from the process.

Q Well, I see that, but the first part of it talks about the difference between households and housing units; does it not?

A (Witness Pitkin) The first part is leading up to the final conclusion.

Q I see. And you reach the final conclusion because of the difference between household and housing units?

MR. LAMOUREUX: Objection; this has been asked and answered.

MR. WILLIAMS: I don't think so. If it has, I apologize.

COMMISSIONER CLARK: I'm sorry, but I'm still confused to. It strikes me that that portion has nothing to do with why you say it's not capable of providing universal service. It's really immaterial to it.

A (Witness Pitkin) The reason it's material is I was trying to go through an explanation of how the

allocation occurs in the first place. The fact that I specified both housing units and households was just to be complete with what they're allocating.

Essentially I go through a discussion of how they allocate. Because of this allocation procedure, they end up with fractional customers. And at the end of the day, those customers are dropped.

MR. WILLIAMS: I don't understand it either, Your Honor, but let me continue.

COMMISSIONER CLARK: I don't -- How is it that -- And as I -- Well, let me ask you this: Tell me what you start with from the census data. I had understood Dr. Staihr to suggest that you only count households with phones.

A (Witness Pitkin) Don Wood would be a better person to tell you exactly what is included in the HAI Model locations.

COMMISSIONER CLARK: Mr. Wood, is that correct?

A (Witness Wood) No. Commissioner Clark, what you've heard here, I'm afraid you've been mislead. I'm not suggesting intentionally, but that's what's happened.

We're referring to households in the model documentation and somehow that's been equated with a narrow definition of the Census Bureau. And those two things simply do not equate.

The idea that you've been given that we don't include vacation homes, for example, somehow because nobody was home when the census taker came by, that sort of thing, that is not the case. We certainly do include all locations with a telephone regardless of whether anybody was home.

COMMISSIONER CLARK: All locations with a telephone?

A (Witness Wood) That's correct.

COMMISSIONER CLARK: So you don't include all housing units?

A (Witness Wood) That is correct. There are things defined as housing units that would not be desiring telephone service. We -- Let's see how I can describe this.

There are -- Certainly any place that constitutes a household, we build to it, whether they have a telephone or not. And certainly all places with telephones we build to. What we try to do with a combination of those is capture places with telephones and places that might need a telephone in the future.

COMMISSIONER CLARK: Why isn't that the same as a housing unit?

A (Witness Wood) In terms of the census definition, I don't know what the incremental difference is.

COMMISSIONER CLARK: Let me ask you this: Would it make sense to start, have as your starting point all housing units? And I assume that includes businesses but under a different category?

A (Witness Wood) The businesses are a different category, and we certainly build to all the business locations.

COMMISSIONER CLARK: This is only housing units?

A (Witness Wood) This is only on the residence side.

COMMISSIONER CLARK: Okay. Doesn't it make sense to build to all housing units?

A (Witness Wood) It depends on the definition of housing unit and that's what I will have to check for you in terms of the census data. We come at it from the other direction. It's everywhere where there is a household of people and everywhere that has a telephone.

COMMISSIONER CLARK: Well, it strikes me that we shouldn't really be having a debate as to where we start from because it seems to me if it's -- although it may not be occupied at some point, if it's a housing unit presumably it will and you will provide service to it.

A (Witness Wood) Right. Remember, too, that this debate relates more to the line count process than it does to the service process. We come back then and true up to

line counts that are provided by the local companies.

When we go through this household process, what we are trying to do -- It's the access line model -- we are trying to get an accurate number, the best we can predict, of the mix of residence and business locations within these areas, these census block areas within the exchange boundary.

Now we can get line counts up at the exchange level. What we're trying to do is get an accurate mix of residence and business and then for residence how many people have first lines versus how many people have first and second lines, how many people don't subscribe at all. We're trying to build up through this process where we use the households of an accurate estimate of residence and business locations in this smaller area.

But then when we come back to build the network, we have to size the network to total lines and service.

So this has been presented to you as if it's somehow this constraint on total network that's built. That's not true. It is the process we use to try to estimate the mix of residence and business customers because we need that information for a couple of reasons.

First of all, the usage patterns are a little different. So we have a different cost for that. And, also, if we're looking at a residence location, there is a

probability of first and second lines and perhaps additionals, but then for business locations there's a probability that there's a lot more lines than 1, 2 or 3. And that's why we then have to look at the demographic data about the business, see what kind of business they're in, how many employees they have. That's all part of this building up process, too, to distinguish between the two. That's the primary use of this household idea.

COMMISSIONER CLARK: All right. Let me ask it a different way. You wouldn't identify a difference in the data you start with regarding housing units or households as being the source for any degree, large degree of difference in your cost models?

A (Witness Wood) I don't believe it is. It is certainly part of a different process we use to do the splitting out of residence and business, but since we're truing up to the number of lines that the companies say they have in place in the first place, then that process really is more important to the division of the lines rather than the number of lines.

COMMISSIONER CLARK: Okay. Thanks.

A (Witness Wood) Now Dr. Duffy-Deno has his satellite process where they go and do the counts and all. They're counting driveways, driveways that may go to houses, barns, you know, never to be again occupied

COMMISSIONER DEASON: The question is: Does the Census Bureau define your barn as a housing unit and does the Census Bureau define your 150-year-old house with the roof caving in as a housing unit?

A (Witness Wood) In the second case, yes. In the first case, I honestly don't know. And that therein is the problem, Commissioner, with using that larger count because you're going to overstate the places that you build to.

MR. WILLIAMS: All right. Thank you.

BY MR. WILLIAMS (Continuing):

Q Let me ask you to turn to page 28 and 29 of your joint rebuttal testimony. And I believe the question is asked on the bottom of page 28, and the answer runs over to page 29 and 30. And this is talking about the BCPM road surrogate approach.

Who's getting this one? Mr. Pitkin, is this you?

A (Witness Pitkin) If the question is limited to the BCPM road surrogate approach, yes.

Q Okay. It is. And you reach the conclusion that this road surrogate approach, which is to distribute housing units, I guess, along the roads, is -- Well, I think you say the BCPM baseline assumption that all customers can be allocated to grids based on road mileage is unreasonable; is that right?

A Yes.

Q And that's what we've been calling the road surrogate approach?

A (Witness Pitkin) Yes.

Q Okay. And your opinion then is that the BCPM road surrogate approach is unreasonable in laying out the network?

A (Witness Pitkin) Yes.

Q Okay. Now would you turn for a moment to page 33 of your testimony. And there is a question on line 8 with an answer starting on line 11 that indicate -- that asks whether the Hatfield approach of placing non-geocoded customers on the perimeter of census blocks is reasonable. And I take it it's your -- Is this your answer?

A (Witness Pitkin) Actually, my answer is that it is a reasonable assumption to use a surrogate methodology for any customers that cannot be geocoded. My criticism is that the BCPM does not use any methodology to try to capture actual dispersion of customers.

To the extent you have information that may be able to assist you in calculating how far customers are apart from one another, that should be your first source of information. Then you can use a surrogate approach for the remaining customers. And --

Q I don't think you let me get to my question yet. You were saying that the surrogate approach that the

A (Witness Pitkin) For using those methodologies for the non-geocoded customers; correct.

Q Right. You wouldn't use them but for the non-geocoded customers in your model; correct?

A (Witness Pitkin) I would recommend not. You could use them in the HAI Model, but I would not recommend it when you have better data available.

Q Right. And it's the lowest density zones, both in Florida and nationally, where geocoding is the least effective; can we agree upon that?

A (Witness Pitkin) Yes, geocoding is the least successful in the lowest density zone in Florida.

Q And so in those lowest density zones, you would have most reliance upon using these surrogate methods; isn't that right?

A (Witness Pitkin) In Florida, in the lowest density zone, 23 -- I'm sorry -- 34% of the customers can be address geocoded. And in the second density zone, 62% of the customers can be geocoded.

So I would say that that is a fairly high proportion of customers that can be geocoded, a fairly high proportion of customers where you can attempt to get actual dispersion information.

Q All right. I think my question was whether or not it is in the lowest density zones that you would have

most reliance in your model upon the surrogate method. You've already explained. Now I think it's a yes or no answer.

A (Witness Pitkin) No.

Q Okay. Thank you.

A (Witness Pitkin) Because in the highest two density zones in Florida, the geocoding success rate is 46% and 50%, whereas in the second lowest density zone in Florida the geocoding success rate is 62%.

So, in fact, in Florida, which is unique, the geocoding success rate is very high in that low density zone.

Q And why is it very low in the highest density zones, Mr. Pitkin?

A (Witness Pitkin) I don't know the answer to that. Mr. Wood may.

Q Mr. Wood, why is it so low in the highest density zones in Florida?

A (Witness Wood) It's actually not unique to Florida. It tends to be --

Q I'm sorry; I couldn't hear you.

A (Witness Wood) I'm sorry. In the very highest density zones it's not unique to Florida. We're talking about 10,000-plus lines per square mile, which is a central business district of a large metropolitan city. That's the

only way you get that arrangement. What you have there mostly are business lines, which all have been geocoded. You do have some residential lines and because of the way some of those addresses are done, oftentimes a post office box, there's a relatively low rate because it's not a geocodable point within that particular density zone.

But there aren't a lot of residences in the 10,000-plus zone to geocode in the first place. Those are office buildings almost exclusively. It's the only way to stack that many lines in a small space.

Q All right. Now let's move ahead, if we could, to page 84 of your joint rebuttal testimony. And I believe this asks almost the ultimate question before this Commission, on the top of page 84, which is how should the inputs to the cost proxy model be chosen, which is one of the fundamental questions you would agree that we have before us.

And you also go on in the answer to point out that before this Commission there are two fundamental questions or two fundamental issues; first, involving the construction of the network in such a way that generally accepted design and placement principles are used; and then secondly, the second set being determination of investments that will be required?

A (Witness Wood) Yes.

Q Do we have context there?

A (Witness Wood) Yes, we do.

Q Now let me ask you with respect to point one, which involves the construction of this model using generally accepted design and placement principles. What does it mean -- How do we determine what is a generally accepted design and placement principle?

Is that you, Mr. Pitkin?

A (Witness Wood) No, actually, this section is entirely mine, Mr. Williams.

Q Okay. I apologize. Mr. Wood, what is a -- How do we determine what a generally accepted design and placement principle is?

A (Witness Wood) Well, I think this goes back to the conversation you and I had on Monday. And that is there are a number of publications that are available that are updated on a regular basis referring to not just these principles generally but to very specific technologies oftentimes in each document. And that's something that it's appropriate to have the engineers look at.

This piece of the testimony is related specifically to inputs associated with these engineering characteristics.

Q I guess my question is a little different. What does it mean to be generally accepted? Generally

end there that the publication indicated no one was using it.

Q I thought that's what you said earlier.

A (Witness Wood) No, it wasn't what I said earlier.

Q All right. Then I misheard you, and I apologize.

A (Witness Wood) Because something hasn't been deployed by incumbent LECs yet, I would not necessarily exclude it from this process.

Q Now early in your testimony -- this is on page 14; you may look, if you wish -- you stated or Mr. Pitkin stated, and I think we can certainly agree here, that issues that do not constitute significant differences between the models should not be the primary focus of this proceeding.

Now would you agree, Mr. Wood, that in selecting a cost model, one of the most important considerations, if not the most important consideration, is to get the costs right?

A (Witness Wood) Absolutely.

Q And would you also agree that a significant portion of a ILEC's total costs are those costs that are incurred in constructing the loop?

A (Witness Wood) In -- Well, I would take the word "constructing" out. With the loop plant, absolutely, that

is the preponderance of the cost of basic local service, but it goes beyond constructing. It's obviously the materials involved and the planning process.

Q Using your correction, I'm fine.

A (Witness Wood) Yes.

Q And what percent of those costs, total -- what would you call it -- total plant and service, what percent of those costs are allocated to the loop?

A (Witness Wood) I'm sorry. You kind of faded off at the end.

Q I'm sorry. I think you agreed that loop costs were a significant portion of the overall costs of a telephone company?

A (Witness Wood) They're certainly part of the -- a significant portion of the forward-looking efficient cost of providing basic local service, which is what we're calculating here. Yes, I agree with that.

Q Right. And now approximately what percent would that be when you say a significant portion?

A (Witness Wood) I can give you a pretty good estimate. Looking at DJW-5 where you have loop costs and then usage costs broken out, depending on the wire center. Obviously in high cost wire centers, it will be slightly higher. In the very low costs, it might be lower. As a part of the mix, it could be 80 or 90%.

Q Eighty or ninety percent of the costs are --

A (Witness Wood) Of basic local service may be represented by the cost on a forward-looking basis of connecting those customers to the local switch, this local loop plant.

Q And you're familiar with the term "cost driver"?

A (Witness Wood) Yes.

Q In allocating the costs that are represented by the loop, what are some of the more significant cost drivers?

A (Witness Wood) Okay. Let me be clear, Mr. Williams, I'm not allocating any costs. I'm building on a bottoms up basis forward-looking costs.

Q Within the 80 to 90%, what are the big components? What are the big ticket items?

A (Witness Wood) Well, the two primary cost drivers for loop costs are length and line density of the area served. Obviously, all things equal, a longer loop is more expensive. And, all things equal, serving a high density area is less expensive than serving a low density area. Those are the two cost drivers for loop plant.

Q Well, let me get a little more disaggregated. Is copper a significant portion of the cost?

A (Witness Wood) For distribution facilities, yes.

Q All right. Man holes, pole boxes, conduit; are

they significant?

A (Witness Wood) For feeder, yes.

Q Rights of way; are they big ticket items?

A (Witness Wood) Depends; they can be.

Q Land and buildings?

A (Witness Wood) For loop plant, very little, if any.

Q Very low?

A (Witness Wood) Very low, because you really only have -- If you were trying to capture some portion of a central office where you've got loop termination either at the MDF or, if it's DLC, straight into a DLC, but then you're looking at the floor space of the entire building represented by this equipment and it's very, very small.

Q What about labor; is labor a significant cost?

A (Witness Wood) Yes.

Q Any other significant costs we should add there?

A (Witness Wood) Well, certainly all the materials involved; certainly the labor of both planning, how to put those in place, and then actually placing them are important. The structures that you use generally, whether it be poles, whether it be conduit, depending on the facility, are also obviously important.

Q All right. Now could you turn to page 87. I think this is you, Mr. Wood.

A (Witness Wood) Yes.

Q You were asked a question on the top of page 87: "Do you agree with BellSouth's and Sprint's application to their stated cost standards when selecting model inputs?"

Do you see that question?

A (Witness Wood) I do.

Q And your answer is "Absolutely not," and you go on to articulate the fallacy of the BellSouth and Sprint positions?

A (Witness Wood) Yes.

Q Is that a fair characterization?

A (Witness Wood) It is indeed.

Q Okay. And then at the bottom of the page you indicate that it's unnecessary to go beyond a geographic area specific cost to a company specific cost unless the objective is to include costs that are currently being experienced by the incumbent LECs that are in excess of those that would be experienced by an efficient carrier; do you see that?

A (Witness Wood) That's correct.

Q And you seem to draw a distinction between an incumbent LEC and an efficient carrier?

A (Witness Wood) I draw a potential distinction; yes, absolutely.

Q Well, when you say "potential," what do you mean?

And in that regard, all these input values should be very specific to the area being served, but you shouldn't constrain them or tie them back to the books of account of the company in terms of what's been done in the past.

If you work on making it specific to the area, then you don't have to worry about a determination of whether Sprint or any other incumbent companies -- or GTE, Bell, whoever -- have been declared to be as efficient as they can possibly be.

Q All right. Now you drew two distinctions there: The difference between where we ought to be and where we were.

All right. Isn't there a third option, which is where we are today in terms of costs?

A (Witness Wood) Well, where we are today is the exact midpoint between backward looking and forward looking. If this is a forward-looking methodology, once you turn and look forward, where we are today becomes part of where we've been. So looking at your books of account today carries forward that historical baggage, and not just books of account. Fill factors, historic fill factors, for example, historic levels of structure sharing; it carries forward bagging, not just from the recent past, oftentimes from the remote past, back to very early days of regulated

monopoly rate of return regulation.

I don't think that is a good starting point for what an efficient competitive company would do in the future, which is the cost standard that the testimony says your company is going to follow, but then the inputs come from the past, not from a projection of the future. That is why I think it's ill advised to start from that earlier position and try to correct it.

Q Is it ill advised to start from where we are today?

A (Witness Wood) Yes.

Q All right. Thank you.

Is it ill advised to start from what the prices are that an incumbent LEC is paying today for a pole or a piece of copper?

A (Witness Wood) To look at that individually, yes, it's ill advised if you don't also look at what opportunity those companies have to purchase those materials for a lower price.

I would not want to start with what you're doing today and just assume that that's what you ought to be doing. That's the distinction.

Q But you are assuming, are you not, that with efficient purchasing practices, the companies are -- what they are paying today is too high; that they are not using

efficient purchasing practices?

A (Witness Wood) I'm actually not assuming one way or the other. What I'm assuming is that we don't know and the Commission has not made a determination that what you are doing or have recently been doing is in fact what an efficient company should be doing on a going-forward basis. And rather than start with that baggage -- And where you are today is a function of everywhere you've been in the past. Rather than start with that and try to correct it, it seems to me a much more appropriate process, much cleaner, much more straightforward process to start looking at all of the available information about where you ought to be going and start from that point.

Q All right. Now you say you're not making any assumptions about where we are going; was that -- Did I understand you correctly?

A (Witness Wood) No, we are doing that. We're not making any assumptions about your current level of efficiency, whether you are or aren't. We're doing this process specific to Florida, not specific to your past operations.

Q How do we go about determining what the costs are that an efficient carrier would incur? How does one make that determination?

A (Witness Wood) Well, that's the process both

sides to this proceeding are describing, as I understand it. We have to have the model and then we have to have the inputs.

Q I understand that's the issue. How do you as sponsoring the Hatfield Model propose that we go about determining the costs that will be incurred by an efficient carrier? Whose judgment do we look to?

A (Witness Wood) Well, that depends on specifically what you're looking at in terms of a model platform or in terms of inputs specifically. I mean, what we're addressing in this section of the testimony are inputs specifically.

Q All right. Well, then let's do inputs.

A (Witness Wood) All right.

Q Whose judgment does this Commission look to if not to look at the costs BellSouth or GTE is paying today; whose guidance should we be directed?

A (Witness Wood) Well, the Commission should consider all the information that it has.

The problem with your question as you've phrased it, what you're paying today, is that if you go to your books of account to collect that, which is the process that's being used, it's not just the purchase price that's being booked there. There's a lot of other costs that may be being booked into those accounts associated with the

purchase price.

This is not a pure question of your input going to your contract with a vendor and pulling it in. If that were the case, it would be a different process.

Q Please listen to my question. I did not ask what we should not be doing. You've already made that clear, tnat we should not be looking at today's cost.

I am asking what we should be doing. How should we be determining the costs that an efficient carrier is incurring? Please answer that question.

A (Witness Wood) All right. For purchasing material, equipment, and facilities, we should be going to find out what price vendors are offering that in the marketplace today.

Q What price vendors are offering it in the marketplace today?

A (Witness Wood) That's correct. That will be different than your booked costs.

Q And if Ms. Daonne Caldwell comes in and tells us that the cost of a pole today is $200; is that a sufficient basis upon which to determine what costs an efficient carrier would be incurring today?

A (Witness Wood) If she takes the $200 from a purchase contract, you would certainly want to consider that. If she took it from the books of account, which is

where most of the inputs came from in the BellSouth run of the model, the answer is no.

If she took it from a purchase contract, you'd certainly want to look at that, but the Commission should also look at potential purchase prices being paid by other carriers, being offered by other vendors, to see if that is in fact the right price.

Q I see. So she shouldn't be taking this cost from the embedded base, but it is appropriate to take the cost from the price quotations that she is getting today in the marketplace?

A (Witness Wood) I would certainly want -- consider that as one of the data points, but if other information is available from other quotes, from other vendors, if I were looking at making this decision, I would want to consider all of those.

Q Now the Hatfield Model is populated with values that are developed by the Hatfield engineering team; is it not?

A (Witness Wood) Many of them are, yes. I had that discussion with Mr. Carver.

Q And those quotations were developed by calling around the country and determining what was the appropriate materials and labor costs experienced in different sections of the country?

A (Witness Wood) In part, that's right. That's part of the process.

Q And that exercise was taken on by the organization generally referred to as the Hatfield Engineering Team?

A (Witness Wood) Yes, the outside plant engineering team.

Q Outside plant engineering team?

A (Witness Wood) Yes.

Q And Mr. Wells is going to be here shortly to tell how he developed those inputs?

A (Witness Wood) He is.

Q Now you would agree that the costs and the input values that were developed by the outside plant engineering team in many instances are lower than the costs that the ILECs are currently experiencing?

A (Witness Wood) I don't know what costs you're currently experiencing. I know what costs you have booked, which is a lot of that information is in the Georgetown Consulting Group testimony where they've imported a lot of information from the books of account and tried to transfer it over into the Hatfield input screens. But that's not -- Again, that is not the comparison that ought to be made. It's the price quotes. I don't necessarily have access to compare to all of your price quotes.

Q The comparison should be made between current purchasing practices, current prices available in the market, and the opinions of the Hatfield engineering team?

A (Witness Wood) That's right. And I think, as you noted, a lot of those opinions are based on their getting vendor quotes from other vendors. And I think that collection of data points is what ought to be considered.

Q Right. I understand they got a great deal of price data from all over the country and have based their opinions on that.

My question is this, sir: To the extent that the Hatfield expert opinion with respect to certain default values is different than the costs that a BellSouth or a GTE is currently incurring on a present basis --

A (Witness Wood) Yes.

Q -- is it your recommendation to this Commission that they should reject the costs that the companies are currently experiencing in favor of the Hatfield expert opinion?

A (Witness Wood) I think the Commission should look very carefully at those differences because many times the costs you are experiencing are a function of your history up to this point that would not be part of a forward-looking efficient economic analysis as Ms. Caldwell and as Dr. Staihr define it in their testimony before they

get around to developing inputs based on books of account.

Q All right. Thank you. Now could you flip over to page 90 of your testimony?

A (Witness Wood) Yes.

Q The question is asked do the incumbent LEC witnesses offer an argument why the use of historic and embedded information, or i.e., company-specific information, as cost model equivalence is equivalent to the objective determination of the cost that would be incurred by an efficient new entrant.

A (Witness Wood) Yes.

Q And your answer is yes, and you go on to say, "Incredibly, BellSouth witness Caldwell asked the Commission to assume that the cost model inputs based on BellSouth's historic records are equal to the comparable input values for an efficient carrier based on her unilateral assessment that the BellSouth network as it operates today exist as a model of efficiency."

A (Witness Wood) Yes.

Q I know I didn't read that perfectly, but did I get the gist?

A (Witness Wood) That is in fact my testimony; yes.

Q Okay. Now let's assume that you were correct and what Ms. Caldwell has done is simply to base the costs that are expected to be incurred in the future upon the embedded

base, which I believe is what you say she's doing?

A (Witness Wood) No, sir. I'm saying that she is basing those forward-looking projections on what you're referring to as current costs that may be reflected in the books of account and maybe come from sources.

The only way that that is the correct value is if BellSouth is in fact as efficient today as it can possibly ever be. I don't think anybody has ever seriously suggested that and certainly no one has ever demonstrated that.

Q No, I was trying to ask a little different question. I'm going to assume that you are right here, okay, and that what BellSouth and others are doing is to actually base future-looking costs, forward-looking costs, upon the embedded base; that's what you say she's doing here?

A (Witness Wood) That's not exactly -- That's why I'm disagreeing. That's not exactly what I'm -- I mean, you can assume I'm right; I'm happy for you to do that. But that's not exactly -- When you then go on to describe what I'm saying, that's not exactly what I'm saying.

Q All right. Now take the hypothetical, whatever you were saying, and assume that BellSouth in this proceeding, or GTE in this proceeding, would be basing forward-looking costs upon the embedded base for the

components in the loop.

A (Witness Wood) All right.

Q All right?

A (Witness Wood) All right.

Q And I think we've already determined that the big cost drivers in the loop are copper, you indicated before, and labor?

A (Witness Wood) I think it's all material and all labor and all structure; that's what we agreed earlier.

Q And structure. And manholes and pole boxes and things like that; right?

A (Witness Wood) Part and parcel of the whole process; yes.

Q Now we also established that these components make up approximately 80 to 90% of total telephone company costs?

A (Witness Wood) No, sir.

Q No?

A (Witness Wood) No. We agreed that these costs on a forward-looking basis make up perhaps 80 to 90% of the forward-looking cost of basic local service.

Q That's fine. Now with that understanding, can you tell me that labor costs, as to what they are today or in the past ten years, are declining?

A (Witness Wood) On a per unit basis, like a labor

cost per hour, no, they're increasing. Total labor costs, however, have been decreasing because the total amount of labor associated with the new technology, the new equipment, the new arrangements, automated arrangements that have been set up for network maintenance and operation require many fewer units of labor.

So while you may be paying ten dollars now instead of eight dollars in the past, your total labor bill, because you're buying so many fewer units, or should be, will be lower.

Q Is your total labor bill to put in a pole in the ground going to decrease?

A (Witness Wood) Depending on the tech- -- Actually, yes; absolutely. I have direct experience with that. The old method of pole placement is two guys and a post hole digger. The new method of pole placement is actually a truck with a large auger that drills a hole and then you place the pole. That process takes a much lower total time than digging the hole manually.

Q When is the last time BellSouth or GTE or Sprint used anything other than a truck, as you just described, to dig a hole in the state of Florida?

A (Witness Wood) I have no idea. It's been a while.

Q It has been a while; hasn't it?

A (Witness Wood) Yes, it has.

Q So wouldn't the books in the account indicate the costs are lower because we've been using more efficient technology for the past ten or fifteen years?

A (Witness Wood) Well, for the pole.

Q At least to dig a hole?

A (Witness Wood) Yes. The pole was your example. My examples were digital switching, for example; loop carrier systems, for example; centralized maintenance and recording, for example -- That's a very large labor item that has gone down substantially because of automated centralized systems.

You need a lot fewer people to operate and maintain your network today than you did in the fairly very recent past. That is something that has changed in the recent past. Your books are still going to reflect the much higher labor costs associated with doing that.

Q For digital equipment and switching, yes. I'm talking about the cost to actually run a trench; have they gone down significantly in the past ten years?

A (Witness Wood) Trenching, yes; absolutely. Trench placement techniques have changed. Plowing techniques have been introduced that actually let you put cable in the ground directly without having to open a trench and then fill it back over. It's a plow blade; the

cable goes through it; it's placed; restored; you move on; you can barely even see the line through the grass. All of those are new techniques; all of those are far more efficient than the old techniques. And they will all lower your total labor bill.

Q Exactly my point. And those techniques have been practiced for at least ten years in the state of Florida by GTE, Sprint, and BellSouth; have they not?

A (Witness Wood) These newest techniques, no. Some of these are quite new. Dual sheath plowing is new, I think, within the last year or eighteen months, two years maybe.

Q I see. And now are you expecting those costs to go down further in the future?

A (Witness Wood) I certainly expect that those efforts would continue, yes. And to the extent that some of these costs are the highest and haven't been improved upon, that's the most incentive to find a new methodology; yes.

Q What about copper costs; do you expect those to go down in the future?

A (Witness Wood) Again, same answer: On a per foot basis, no, I expect them to increase, but the new utilization of carrier systems which allow far more lines to be provided on a single strand or few strands of copper

make the per line costs go down. So when you're looking at raw material costs for copper and labor, that's moving up; your costs on the relevant per unit basis are trending down for each one of these, all of these things.

There is no reason to assume that technical innovation in this industry is going to come to a dead halt tomorrow. I don't think that's going to be the case.

Q We have been experiencing, though, technical innovation for a number of years; have we not?

A (Witness Wood) We have, and it continues.

Q And we can expect to see the fruits of the technical innovation already on our books in account; can we not?

A (Witness Wood) For some of the very earliest innovations you will see some of those. For some that have been implemented in the most recent past, you will see none of it. And for the ones in between, you will see some of it.

Q And with respect -- Assuming that we are using current costs to determine forward-looking costs, in terms of copper, in terms of labor, et cetera, we're not going to see much decrease in the future; are we?

A (Witness Wood) If you're operating at all efficiently, you would certainly see decreases in all of those categories for the reasons I just described to you.

All possible efficiencies have not been reflected in your current books. And, in fact, all existing technology efficiencies aren't reflected and the impact of those.

Q But they are --

A (Witness Wood) This centralized network maintenance, for example, is just being implemented. You're just going through the process of decreasing your staff for network maintenance. And, in fact, those are systems that have been paid for in the last couple of years. We're probably going to see the fruits of that in the future, in the next few years that we don't see yet.

And, again, that's not trivial; that's a big ticket item. There's a lot of labor costs there.

Q You have reviewed the input values of the Hatfield engineering team?

A (Witness Wood) I have.

Q And do you endorse those?

A (Witness Wood) It's not my position to endorse or not to endorse those. I have talked to those individuals. I'm very comfortable based on the task performed and the background of the folks that did it with the inputs, but it's not my task here to validate or not validate those inputs. That's Mr. Wells.

Q As a methodological matter, though, it is your belief that the input values obtained by the Hatfield

engineering team are superior and more efficient and more forward looking than the costs that have been developed by the other parties in this proceeding?

A (Witness Wood) Absolutely.

Q Good. Now you appeared on behalf of AT&T in the South Carolina universal service proceeding; did you not?

A (Witness Wood) Yes, I did.

Q And your testimony was similar to what it is in this proceeding; is it not?

A (Witness Wood) It certainly better be; yes, sir.

Q And you're aware in that proceeding that the Commission, the South Carolina Public Utility Commission, expressed serious doubt about the independence of the Hatfield outside plant input team; are you not?

A (Witness Wood) I saw that in the order, yes.

Q That does not concern you, I take it?

A (Witness Wood) No, it does not because I am very comfortable with the independence of the outside plant engineering team.

Q Well, if you are -- Are you aware of the circumstances under which the engineering team was retained by AT&T and MCI and Hatfield Associates?

A (Witness Wood) I'm not sure what you mean "the circumstances."

Q Well, let me try this. Are you aware that the

leader of that Hatfield engineering team, who is John Donovan -- He's known to you; is he not?

A (Witness Wood) He is. And he is the leader. He's a former NYNEX employee.

Q Mr. Donovan was hired by Hatfield and AT&T and MCI after he was interviewed by those organizations and was asked a number of questions regarding his opinion of the cost of various components of the outside plant network; was he not?

A (Witness Wood) I don't know specifically what interview process. I certainly hope they interviewed him before they hired him, but I don't know --

Q They did interview him.

A (Witness Wood) But I do not know the details of that process.

Q Did you know that before they hired him they asked his opinion about the level of costs of various outside plant components?

A (Witness Wood) I would certainly think they would want to know that to validate his expertise.

Q Thank you.

Now we talked before about the efforts of the Hatfield engineering team to obtain data on which to base their expert opinion; do you recall that discussion?

A (Witness Wood) Yes.

Q And you're aware that some of the data that they collected was inconsistent with their subsequent opinions on default values; are you not?

A (Witness Wood) I don't know what you mean by inconsistent.

Q Higher than.

A (Witness Wood) Well, certainly; they got a range of quotes. And they didn't pick the highest one. I don't think you have -- I don't know how you design an efficient network with going with the highest bidder.

Q Well, in fact, you are aware that in coming up with average prices to be used, as they started out, try to collect, that they excluded the more expensive vendor prices that they received in their survey?

A (Witness Wood) Again, all I can tell you about the process is that they collected some quotes. And I certainly would not expect them to go with the high bidder as reflective of an efficient process. No one would stay in business very long if they did that.

Q Mr. Wood, would you agree, subject to check, that the Washington Public Utility Commission found that the method used to collect data from the vendors by the Hatfield engineering team was flawed?

A (Witness Wood) I would want to see the context of the statement. I'm not familiar with that part of the

Washington Order.

Q And would you agree, subject to check, that -- Have you seen that decision, by the way?

A (Witness Wood) If we're talking about the same decision, then yes, I have.

Q Well, then do you recall --

A (Witness Wood) There have been a number of Hatfield Model-related decisions out of the Washington Utilities Commission.

Q Would you agree, subject to check, if you've looked at that decision, that the Washington Public Utility Commission found that the outside plant data collected from the vendors does not provide sufficient validation for the opinion of their experts?

A (Witness Wood) I just simply don't know. I have not -- If that's the same order, I haven't seen that section.

Q I'm sorry. I thought you had.

I want to ask you about the regional labor adjustment factor.

A (Witness Wood) Yes.

Q Is that you?

A (Witness Wood) Yes.

Q Okay. And, as I understand, it is 68% here in Florida?

A (Witness Wood) That's correct.

Q So what happened -- And the benchmark, I take it, is of 100% is New York?

A (Witness Wood) That's correct. There were -- The initial estimates that had been worked through by Mr. Donovan and Mr. Riolo had been based on New York data costs. We have a national labor cost benchmark from the R.S. Means publication, which is used standard throughout the industry. I certainly used doing cost studies at BellSouth.

And it provides these factors normalized on the national average. In other words, the national average is one; a fraction below that would be a lower than average cost. A number higher than one would be a higher than average.

We simply normalized them on the New York value, which was slightly higher than one, in order to make that consistent with the bidding information and the construction information based on Mr. Donovan and Mr. Riolo's experience.

So this is just a mathematical adjustment of the R.S. Means data. There is no additional adjustment beyond that.

Q So I think what you said is the information collected by Mr. -- Was it Donovan?

A (Witness Wood) Yes.

Q And Mr. Riolo?

A (Witness Wood) Yes. Both of those individuals in their careers had direct responsibility for planning network design and then going out, receiving contractor bids, and actually going through the construction process. To rely on that experience with New York labor costs, we wanted to normalize the process to adjust from that base. But it's simply a mathematical adjustment to R.S. Means. We didn't assume or adjust anything to the published data other than to normalize it.

Q I understand. I understand. The mathematical adjustment from 1.0 to 68% here in Florida was simply a mathematical adjustment?

A (Witness Wood) That's correct.

Q But you started with New York prices, and that was -- or New York costs?

A (Witness Wood) Labor costs.

Q Labor costs; yes.

A (Witness Wood) Yes.

Q And those were the ones that were acquired by Riolo and Donovan and Facet by the engineering team?

A (Witness Wood) That's right. Over career spanning 30-plus years I think for each one of them.

Q So all of the labor components then in the

Hatfield model, the default values that include labor rates, are labor rates based upon New York?

A (Witness Wood) No, they're labor rates based on Florida.

Q I understand.

A (Witness Wood) From R.S. Means.

Q But that's because you have applied the 68% adjustment?

A (Witness Wood) No, that's not quite right. When you place a cable and you develop an E, F, & I investment, you have a material component and you have a labor component.

Q I'm just talking about the labor component.

A (Witness Wood) Right, but they are part and parcel of the same investment.

Q Understood.

A (Witness Wood) Mr. Donovan and Mr. -- Well, a number of those individuals, including Mr. Donovan, had experience purchasing and placing those materials. And what they relied on was their experience in the portion of the total investment represented by material and the portion represented by labor. That was their relevant experience. And that would apply universally. That's not unique to any one state. But the numbers associated with that were specific New York labor. That was why there is a

renormalization of the process to get Florida-specific labor. But this factor is for Florida-specific labor as published by R.S. Means.

Q Yes, I understand that. So the labor numbers associated with each of these tasks was based upon New York labor rates?

A (Witness Wood) The division of material and labor in the E, F, & I investment is based on that New York experience. The labor rates are Florida.

Q The labor rates are Florida because you have in this proceeding provided the 68 adjustment?

A (Witness Wood) Adjustment to that. That's right.

Q So, for example, just to make sure everybody understands, when we see in the Hatfield Input Portfolio Summary binder a labor cost for putting in a pole, to stay with that example, and it's $200, that $200 is based upon a New York labor rate?

A (Witness Wood) It is based on the mix of material and labor from Mr. Donovan and the other members' experience in New York, but then the labor rate itself is not New York; it's Florida.

Q I see. The amount of labor required would be based upon a New York analysis?

A (Witness Wood) The mixture of material costs and labor as part of this total capitalized investment, which

includes both, is from that experience; that's right.

Q And so the entire assumption of the Hatfield Model with respect to labor is to apply an adjustment factor to, and use the mix benchmark against New York rates; is that right?

A (Witness Wood) I'm not sure how else to answer this, Mr. Williams. I thought I tried. It's the mixture of the two investments, of the two portions of this investment that is from the New York experience.

If it were from national average experience, you would still see a factor applied in Florida from R.S. Means because labor rates vary across the country. That's what we're trying to capture here and that's why we use that data.

The New York experience simply means that we normalized that data based on a different benchmark of one than the national average. There is no other -- There is no New York residual beyond that. It's the published Florida labor rates that we used.

Q So, for example, with respect to aerial drop placement -- I'm just looking at the HIPS binder here, when we see direct loaded labor rate of $35 -- I'm looking at page 16, which is the Section 2.2.2 --

A (Witness Wood) Yes.

Q When we see the $35 figure there, that is a labor

rate from New York?

A (Witness Wood) That's actually a contract rate; that's right.

Q All right. And then up at the top of the page, when we see a drop placement aerial and buried per foot, buried per foot of 60 cents per foot, that's a New York rate?

A (Witness Wood) Well, not quite. It is that portion from New York based on the split out of the material and the labor. That's why we apply the Florida factor to make it the Florida labor cost.

Q I misspoke. The labor portion of that 60 cent per foot is from New York?

A (Witness Wood) The contract amount is, yes. That's why we changed this value and why this labor adjustment factor flows through to all of these variables so that we use Florida specific labor.

Q I understand that you have adjusted it 68%. I'm just trying to get the starting point.

A (Witness Wood) That's right. I thought we had agreed on that.

Q That's right. I think we do.

And then, just to complete this page 11, when we're talking about the installed mid, the labor for the installed mid, do you see that, basic labor, $15?

A (Witness Wood) Yes.

Q That, too, would be a New York based labor component?

A (Witness Wood) Well, it has to be, even if the original experience isn't New York, in order to use the same labor adjustment factor, we normalize these to that level and then apply the same factor to each one.

We didn't have to do it that way. We could have taken a lot of these that have nothing to do with New York, applied a national average labor and had two separate labor factors going on in the model, but that doesn't seem to be the easiest way to use or build this thing.

Q And it is your understanding that we have normalized to New York because all of the material, all of the price vendor quotes, et cetera, was linked to New York?

A (Witness Wood) No. Absolutely not. There is none of the material vendor quotes are related to New York specifically. Some of the mixture of material and labor as components of E, F, & I investment were in order to apply the same set of factors throughout; the others were normalized on that basis so we wouldn't have multiple factors going on in the model.

But that in no way implies that anything beyond the labor assessment comes from New York. And it in no way should imply that all of the labor assessments have

anything remotely to do with New York.

Q I am talking only about labor. Are you aware of the fact that Mr. Facet, Mr. Riolo, and Mr. Donovan conducted a national survey in order -- and obtained labor costs from all over the country and not just New York?

A (Witness Wood) Yes; that was just my point.

Q Right. Now let me ask you a final question, sir, about the network operations expense.

A (Witness Wood) Yes.

Q Is that something I can direct to you?

A (Witness Wood) Yes, you can.

Q What is it, first of all?

A (Witness Wood) These are the costs associated with several different ARMIS accounts related to the operation of network facilities.

Q What are the components of network operations?

A (Witness Wood) I've got -- Hold on. There is an appendix to the Hatfield Inputs Portfolio. It's Appendix D, that lists the accounts that are involved. It's 6512, network provisioning; 6531, power; 6532, network administration; 6534, plant operation administration; and 6535, engineering.

Q Now the network operations expense has gone through some changes since Hatfield 2.2.1; has it not?

A (Witness Wood) Yes, it has

Q All right. By the way, do you have the testimony of Dr. Tardiff in front of you?

A (Witness Wood) I don't.

MR. WILLIAMS: Your Honor, I'm going to be referring to an Attachment 3 to Mr. Tardiff's testimony, page 194 of his testimony. The attachment is No. 3. It is page 194 of 347.

CHAIRMAN JOHNSON: Is that something to be --

MR. WILLIAMS: I'm just going to be referring to an attachment on this network operations expense, which was appended to Dr. Tardiff's testimony. He is one of GTE's witnesses. We wanted to make sure this was in the record.

CHAIRMAN JOHNSON: Okay.

BY MR. WILLIAMS (Continuing):

Q And I want to ask Mr. Wood or Pitkin -- Who is the network operations?

A (Witness Wood) I am.

Q You are. Okay. Have you had a chance to look at that, Mr. Wood?

A (Witness Wood) I have.

Q Have you seen this document before?

A (Witness Wood) I have.

Q I'm sorry; you have?

A (Witness Wood) I have.

Q All right. This is a white paper written by an

individual named Paul Hansen, who is an AT&T employee; is that right?

A (Witness Wood) He is.

Q And Mr. Hansen has discussed a problem relating to the network operations expense in the Hatfield Model and the justification for that expense factor; is that correct?

A (Witness Wood) That's the way his paper is organized. Let me be very clear. This was not the model developers' problems or any of our problems. This was Mr. Hansen's problem.

In other words, he was not involved with the development of this value. The value had been developed. He was assigned a task to go and collect the basis that we had used to do that. He glorified that a little bit in terms of a white paper, but he could have just called us and told us.

But he was charged with pulling some information together from the various people involved in the process, actually including me. Some of what's in here, he called me and I gave to him over the phone. It's the same information that's in Appendix D to the Inputs Portfolio.

But this was not a case of Mr. Hansen trying to develop this factor. This factor had -- Mr. Hansen had nothing to do with that process.

Q Who assigned him this task of doing whatever he

was supposed to do?

A (Witness Wood) I don't know. I expect it may have been Mike Lesher.

Q Excuse me?

A (Witness Wood) Mike Lesher may have been the person who did that. That is either his direct boss or two layers of management above him at AT&T.

Q Well, could you tell us -- Oh, at AT&T?

A (Witness Wood) Yes.

Q Somebody at AT&T directed Mr. Hansen to write this paper?

A (Witness Wood) No. No. That's why I want to be very clear.

We developed -- There had been ongoing efforts to develop the proper factor. And the reasons behind the development I think are best summarized in Appendix D for the Inputs Portfolio. That's why it's there.

Young Mr. Hansen was actually assigned the job of pulling together all the relevant information so that we could write this up in a way that would make the information available when we filed the model. He, as I said, apparently glorified that a little bit and created what he calls a white paper.

But what he's describing is his experience and his task of pulling the information together, not the

process at all that we used to develop the factor.

Q Mr. Hansen indicates in this that initially the Hatfield Model used a network operations factor of 70%, and that was in version 2.2.2; is that right?

A (Witness Wood) And that statement in here is correct.

Q Right.

A (Witness Wood) He was right about that.

Q And by using a 70% network operation factor, that means that what the Hatfield model did was to reduce all network operations expenses, as you have defined them here, by 70% -- excuse me -- by 30%?

A (Witness Wood) In total, yes.

Q In total?

A (Witness Wood) That does not suggest -- And there has been some confusion about this apparently. It doesn't suggest that each category and account would be reduced by the same amount.

Q Did I suggest that? I didn't suggest that; did I?

A (Witness Wood) It's been suggested in other proceedings. I just don't want to have any confusion. It's the total amount.

Q No, that's not the issue right now.

A (Witness Wood) All right.

Q Okay. And then what happened was Hatfield 3.1 is released and the network operations factor is reduced to 50%?

A (Witness Wood) For the reasons described here, yes.

Q And the basis for the reduction and the basis upon which AT&T and MCI supported the 50% reduction was certain testimony that was given by Richard Scholl in a California PUC proceeding?

A (Witness Wood) No. That was never the case.

Q Well, that was the basis, was it not, of the 70%?

A (Witness Wood) No.

Q Are you sure about that?

A (Witness Wood) Positive about that.

Q (Witness Wood) Mr. Scholl originally had some testimony consistent with the value we had developed. We cited to that testimony as supporting evidence. Mr. Scholl later recanted that testimony and we stopped referring to it as supporting evidence, but at no time has it been the basis for the decision.

The basis of the decision is looking at the various sub accounts, likely trends in those sub accounts, some double counting that occurs in the expenses, some expenses that are already being recovered through nonrecurring rates that we would double count if we

included them here. There's quite a few things.

Dr. Scholl had -- I'm sorry. Mr. Scholl had testimony that supported the amount and we cited to that. He recanted it. We stopped citing to it.

Q You have cited to Mr. Scholl's testimony as a basis for the reduction in network operations; haven't you?

A (Witness Wood) No; as support for.

Q As support for it, you have cited to his testimony?

A (Witness Wood) Yes. That is not the basis, but at the time he gave the testimony it was supporting information.

Q All right. And then subsequent Pacific Bell provided a declaration by Mr. Scholl in which he asserted that the characterization of his testimony by Hatfield was a misrepresentation; isn't that correct?

A (Witness Wood) Yes. I've read his original testimony. I think Mr. Scholl just changed his mind, but I guess it's his prerogative to do that.

Q Regardless of whether he changed his mind or he felt he was misrepresented, he wrote to the FCC and stated that his view was being misrepresented; correct?

A (Witness Wood) And we at that point stopped citing his testimony.

Q Right. And also at that time Mr. Hansen was

charged with the assignment of finding support for the 50% NOE factor other than the testimony of Mr. Scholl; isn't that right?

A (Witness Wood) No. Mr. Hansen was only charged with the development of the factor having been completed going to the various people involved, collecting the information so we could write it up in Appendix D, which is what we did.

Q Well, Mr. Hansen in his white paper describes the problem faced by Hatfield in which --

A (Witness Wood) No; it was a problem faced by Mr. Hansen.

Q All right.

A (Witness Wood) Not the problem faced by the model developers or any of the developers of the inputs. This was his assignment and this was his problem and his solution. This was not our problem and our solution. We already knew the answer. It's what's in Appendix D. It was just information; bits and pieces of it were with a lot of different people and somebody needed to go put it all in one place so we could write this up.

Q All right. We're almost done, Mr. Wood; just bear with me.

A (Witness Wood) No problem.

Q There is a problem, and I want you to read the

problem here.

On Page 1 of the white paper there is a statement of a problem. And could you read the first sentence of that and read any more if you want, but just please read into the record the first sentence, under the word "Problem."

A (Witness Wood) "Pacific Bell provided a declaration by Mr. Scholl in the California Public Utilities Commission proceeding R93-04-003" -- I can't tell if it's an i or an 1 -- "9304002, Appendix B, page 7, in which he asserts that Hatfield's characterization of his testimony is a misrepresentation."

Q All right. And then on the next page, Mr. Hansen has a section entitled "Solution;" does he not?

A (Witness Wood) Yes.

Q And could you read the first sentence of that section?

A "Find support for the 50% NOE factor other than testimony of Richard L. Scholl."

Q Now, last question, sir: As an economist, or one who studies economics, do you consider it appropriate to first arrive at an assumption and then develop support for that assumption?

A (Witness Wood) No. And that's not the process that was followed here.

Q Thank you.

A (Witness Wood) Mr. Hansen's finding of the information, including, in part, calling me because I gave him my notes.

MR. WILLIAMS: I have nothing further. Thank you very much.

Pass the witness.

CHAIRMAN JOHNSON: BellSouth.

MR. WILLIAMS: Or witnesses, I should say.

MR. CARVER: Thank you, Madam Chairman.

CROSS-EXAMINATION

BY MR. CARVER:

Q Good afternoon, Misters Wood and Pitkin.

A (Witness Pitkin) Good afternoon.

A (Witness Wood) Good afternoon, Mr. Carver.

Q My name is Phil Carver. I represent BellSouth.

The first question I have I would like to direct to Mr. Wood because it's a follow-up. I'd just like to ask for a clarification of something you said a little bit earlier.

A (Witness Wood) Yes, sir.

Q I believe in response to one of the questions early in the examination by Mr. Williams, you said that in Nevada the Commission had considered earlier versions of both BCPM and Hatfield; is that correct?

A (Witness Wood) Yes.
Q And which version of Hatfield was being considered?
A (Witness Wood) I do not recall the specific version. It's on -- It's part of what's on the FCC website in terms of the Nevada recommendation, but I don't remember offhand the exact vintage of the proceedings or which version would have applied.
Q Could it have been 4.0?
A (Witness Wood) It could have been.
Q It definitely wasn't 5.0?
A (Witness Wood) It certainly was not this current version of 5.0; no.
Q Okay. It might have been a earlier version of 5.0?
A (Witness Wood) My recollection of the timing of the Nevada proceeding is that that's unlikely. I don't think it was ready then, but I don't know for sure. But it wasn't this current version of either of these models.
Q So it was probably 4.0 or earlier then?
A (Witness Wood) Again, that's my best guess, but I'd be glad to look that up for you. It's on the website.
Q Now 4.0 did not utilize geocoding; did it?
A (Witness Wood) That's right.
Q So the model, the version of the Hatfield model,

whichever one it was before the Nevada Commission, would not have used geocoding to locate customer locations; correct?

A (Witness Wood) Well, that's what I don't know. It may have been an earlier version that did include geocoding, an earlier version of release 5. I just simply don't know without looking.

Q Okay. To the extent you don't know then, is it fair to say that when you put this in your testimony to quote Nevada, you were not representing that as being an endorsement of the geocoding process; is that a fair assumption?

A (Witness Wood) That's fair. And let me be very clear. None of the previous proceedings leading up to this one that resulted in a recommendation of either model is an exact endorsement of what's being presented here because these are all updates of previous versions. So none of what's happened in the past that resulted in an endorsement of BCPM or Hatfield is exactly the same as the question before the Commission here.

Q Okay. In the testimony, the rebuttal testimony, nevertheless, there are many citations to opinions from other Commissions; you would agree with that?

A (Witness Wood) There are several; yes.

Q Okay. And I want to ask about two of them,

specifically the citations to Kentucky and to Louisiana.

Now are you the person who should address that or would that be Mr. Pitkin?

Q (Witness Wood) That would be me.

Q Okay. Let's focus on Louisiana first of all. Although Louisiana adopted Hatfield as a platform, it rejected most of the Hatfield inputs; isn't that true?

A (Witness Wood) No. It decided to modify a handful of Hatfield inputs.

Q Okay.

A (Witness Wood) I've got the order right here.

Q Okay. In terms of the significant -- Those handful that were modified -- And I'm just accepting your characterization for purposes of the question. I don't necessarily agree it was a handful. We'll get to that later.

But as to the ones that were modified, those were all significant cost drivers; were they not?

A (Witness Wood) Some were; some weren't. And some had an impact on costs. Some were far less significant. There was a range.

Q Well, I have a number of questions about the particular inputs that were modified. And you tell me how to proceed. These are engineering inputs, but my questions are keyed to the Louisiana order.

A (Witness Wood) Okay. I have the order if you want to refer me to it, I'll be glad --

Q I was just going to ask, since they're input questions that relate to that order that's cited in your testimony, should I direct that to you or to Mr. Pitkin or to Mr. Wells later?

A (Witness Wood) I believe the answer is to me. If you have a specific engineering problem, I'll let you know and I will suggest Mr. Wells. But at this point I think it's me.

Q Okay. Before we start on the specifics, just one thing I want to clarify, just so that we get our references straight. In Louisiana there was a rather lengthy staff recommendation and then a short Commission order adopting that recommendation; is that correct?

A (Witness Wood) That's correct.

Q Okay. So when I refer to the Staff recommendation, that in this instance is synonymous with the order; understood?

A (Witness Wood) I understand you intend it that way; yes.

Q And would you agree with me that that's a fair characterization?

A (Witness Wood) Well, certainly if you're going to understand the order, you have to have the Staff

recommendation because that's where the details are.

Q Okay. And I believe there was a place -- not to quibble -- but I believe there was a place specifically in your testimony, on page 9 or 10, where you just simply say that the Commission voted to adopt Staff's final recommendation utilizing the Hatfield method and Staff's input on costs. That's lines 19 through 21, page 10?

A (Witness Wood) Yes.

Q Okay. Now length of the drop wire, the Hatfield model proposed based on varying density zone drops ranging from 50 to 150 feet; correct?

A (Witness Wood) That's correct.

Q And the Staff recommended a drop length on a deaverage basis of 177 feet; correct?

A (Witness Wood) I think they suggested 177 be used for everything, across the board.

Q Well, no, actually I would -- That's my next question, although you may have answered it. I believe the process there -- and perhaps this will refresh your recollection -- was that they took 177 as the average rate and then they deaveraged it by density zone, so that in the most dense area it's 50 feet; in the least dense area it's 390 feet. Does that refresh your recollection?

A (Witness Wood) I don't recall the specific numbers. It's been a while. If you've got a page

reference, I've got the Staff rec right here.

Q Okay. And this information that you don't recall specifically would be listed on Exhibit 3 to that recommendation; correct?

A (Witness Wood) Well, I guess I'll find out.

Q Okay.

A I think the answer is yes.

(Whereupon, the transcript continues in Volume 16 without omission.)

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