

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

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

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

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NO. 65, DWJ/BFP 1 thru 21

1639

P R O C E E D I N G S

1
2 (Transcript follows in proper sequence from
3 Volume 14.)

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

6 Do you have a preliminary matter?

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

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

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

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

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

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

14 CHAIRMAN JOHNSON: Mr. Hatch.

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

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

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

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

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

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

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

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

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

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

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

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

17 Mr. Fons.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4 COMMISSIONER JOHNSON: Do they need to scoot
5 down?

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

8 Thank you.

9 WITNESS WOOD: He has the better looking head.

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

12 CHAIRMAN JOHNSON: You need a --

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

15 CHAIRMAN JOHNSON: Can you see him now?

16 MR. WILLIAMS: Yes, thank you.

17 CHAIRMAN JOHNSON: Okay.

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

22 Mr. Wood, could you please state your name?

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

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

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

3 A (Witness Pitkin) Yes, we did.

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

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

10 Q Any other changes or corrections to make to the
11 testimony

12 A (Witness Pitkin) No.

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

15 Are there also exhibits to the testimony as well?

16 A (Witness Pitkin) Yes.

17 Q How many exhibits are there?

18 A (Witness Pitkin) Twenty-one.

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

22 CHAIRMAN JOHNSON: Sixty-five.

23 Could you give me that short title again?

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

1 CHAIRMAN JOHNSON: Okay. It will be marked as
2 65.

3 (Exhibit 65 marked for identification.)

4 BY MR. LAMOUREUX (Continuing):

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

7 A (Witness Pitkin) Yes.

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

9 A (Witness Wood) Yes.

10 Q Do you have a summary of your testimony prepared?

11 A (Witness Pitkin) I do.

12 Q Would you give that now, please?

13 A (Witness Pitkin) Yes. Thank you.

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

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

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

25 The BCPM's inefficient feeder and subfeeder

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

3 This is a model supported by witnesses stating
4 that a loop should not exceed 12,000 feet, but this is the
5 only model in this proceeding that has customers over
6 18,000 feet on copper.

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

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

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

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

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

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

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

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

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

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

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

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

9 Put simply, the only thing you have in terms of a
10 validation process is to compare what these two models
11 produce and the HAI Model performs better against the MST
12 standard and, as I said earlier, the HAI model has almost
13 4,000 more route miles of distribution cable than the
14 BCPM.

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

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

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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.

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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 YOUR 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.

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

15
16 **Q. ARE THERE EXHIBITS TO YOUR TESTIMONY?**

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

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

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

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

- 1 Comment on Model Platform Development," Released
2 August 7, 1998
- 3 DJW/BFP-4: Maps illustrating that the BCPM does not serve all
4 customers
- 5 DJW/BFP-5: BCPM output reports showing the investment and cost
6 generated by the BCPM using the BCPM's "default
7 switching method" and the "SCM switching method"
- 8 DJW/BFP-6: HAI geocoding success rate by state and density zone
- 9 DJW/BFP-7: AT&T and MCI June 10, 1998 Ex Parte filing with the
10 FCC titled "HAI Model 5.0a - Why it Engineers the
11 Appropriate Amount of Distribution Plant"
- 12 DJW/BFP-8: BCPM ultimate grids vary in size across the United States
- 13 DJW/BFP-9: Bellcore comparison of bush v. branch design
- 14 DJW/BFP-10: Graphical comparison of the BCPM and HAI Model
15 approaches to customer location and outside plant design
- 16 DJW/BFP-11: Illustration of MST Analysis on the BCPM
- 17 DJW/BFP-12: Graph of HAI Model Copper Analog Distribution Loop
18 Lengths
- 19 DJW/BFP-13: The BCPM does not build cable to reach modeled customer
20 locations
- 21 DJW/BFP-14: Square lots are inefficient and result in increased developer
22 costs

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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

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

15
16 Second, the way in which the BCPM methodology employs these road
17 surrogate locations result in customers not being located at all. As we
18 describe below, the BCPM does not serve all households -- a requirement
19 for cost proxy models that are to be used to calculate universal service.

20
21 Third, the BCPM relies upon this same arbitrary grid structure to establish

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

16
17 Fourth, while the BCPM employs too much DLC and too much subfeeder,
18 it still fails to provide sufficient distribution plant to actually reach the
19 customer locations that it hypothesizes. This arises because of two
20 additional assumptions made by the BCPM, *i.e.*, (1) to build distribution
21 plant only within a "road-reduced" quadrant (the area of which is set equal

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

10
11 The shortcomings in the BCPM result in the worst of all worlds --
12 substantially overstated costs for a basic local exchange network that fails
13 to reach many of the Florida customers that it is intended to serve. The
14 carrier serving area design employed by the BCPM -- which fails identify
15 accurately customer locations and serve them efficiently -- is its most
16 critical design flaw, one that affects virtually every other calculation in the
17 model.

18
19 **Q. HAVE OTHER STATES REACHED CONCLUSIONS SIMILAR**
20 **TO YOURS REGARDING THE DEFICIENCIES IN THE BCPM**
21 **AND THE SUPERIORITY OF THE HAI MODEL?**

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

6

7 **The Minnesota Public Utilities Commission also found that:**

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

17

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

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

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

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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

1 identify the actual geographic locations of customers are preferable to
2 algorithms intended to estimate customer locations based on
3 information such as census block data.
4

5 In addition, the FCC notes that:

6 in this public notice, we consider a model platform that groups
7 customers using a clustering approach because it appears to have
8 advantages over gridding approaches. HAI has placed the computer
9 code for its clustering algorithm on the record in this proceeding.
10

11 Thus, it appears that for virtually all aspects of the customer location
12 process, the HAI Model uses (or has been adjusted to incorporate) an
13 approach that is endorsed by the FCC. The BCPM does not geocode
14 customers, and does not use a clustering approach to identify serving
15 areas.
16
17

18 **II. PRELIMINARY ISSUES TO BE ADDRESSED BEFORE**
19 **EVALUATING COST MODELS**
20

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

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

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

16 X *Should a model contain loops with copper distances in excess of*
17 *12,000 feet?* In fact, both models construct a small percentage of
18 loops in Florida with copper distances in excess of 12,000 feet. As
19 a result, the feasibility of this design feature should not be an issue
20 in this proceeding.

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

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

14
15 The New Mexico State Corporation Commission found that "the use of
16 housing units, rather than households, results in a cost estimate that
17 reflects the assumption that plant is built in areas where no one lives and
18 for which the local exchange company has not constructed facilities."

19 This Commission ultimately concluded that "the use of housing units is a
20 significant shortcoming in BCPM."⁵

21

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

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

11
12 The BCPM proponents have adopted non-standard definitions of feeder
13 and distribution facilities. The BCPM output actually classifies *all*
14 connecting cable constructed by the model as feeder plant, even when
15 some of this cable is on the customer side of the FDI. This non-standard
16 classification is explicitly recognized in the BCPM 3.1 documentation,
17 which states the "while this is typically considered distribution cable, the
18 Model has fixed the classification of this cable as feeder. In a future
19 release of the BCPM, this cable will be classified differently." (BCPM 3.1
20 Methodology, Section 6.7, footnote 37).

21

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

7

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

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

17

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

20 The HAI Model was developed to estimate the costs incurred by an
21 efficient carrier building a network using current technology and costs.

22 The consulting group designing the model used long-run forward-

1 looking costs. The model correctly applies a long-run assumption by
2 treating the ILECs' embedded cost structure, except for the location of
3 wirecenters, as variable and avoidable.*
4
5

6 In addition, it is appropriate to be extremely skeptical regarding the relevance and
7 accuracy of embedded and historic data, especially when the support for the data
8 has not been provided. While the ILEC's have provided proprietary inputs into
9 the BCPM, they have not produced the sources to these inputs. A recent article
10 titled "Assessment Sought on Bell Rates," attached as Exhibit: _____ (DJW/BFP-
11 2), reveals that "an audit by the Federal Communications Commission show that
12 some of the equipment the Bells have on their books cannot be accounted for."⁷
13

14 Again, F. S. 364.025 (4) (b) rejects the use of embedded characteristics and
15 historic information and requires that the cost model use total forward-looking
16 costs based on the most recent commercially available technology and equipment
17 and generally accepted design and placement principles.
18

19 **III. A SERIOUS FLAW IN THE BCPM DESIGN ASSUMPTIONS**
20 **RENDERS THE MODEL'S NETWORK INCAPABLE OF PROVIDING**
21 **UNIVERSAL SERVICE**
22

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

11
12 Exhibit: _____ (DJW/BFP-4) contains examples of this phenomenon. In
13 each case, we have shown the customers allocated to the microgrids within
14 each ultimate grid, even where those microgrids are located within
15 supposedly unoccupied ultimate grids. For the sake of comparison, we
16 have shown three maps for each wire center (one Florida wire center and
17 two Texas wire centers). The first map shows the number of households
18 reported by the Census data for each Census Block. The second map
19 shows the distribution areas to which the BCPM actually builds facilities,
20 illustrating that the BCPM network built in each of these wire centers does
21 not serve all of the households located in the wire center. The last map

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

3
4 The bottom line is that the BCPM fails to build *any* outside plant to some
5 of these occupied locations, even though the BCPM preprocessing
6 demonstrates that there are customers in these locations (this situation is
7 most likely to occur in a large census block with relatively few customers
8 and a substantial amount of road distance -- in such circumstances, the
9 BCPM preprocessing will allocate a fractional customer to the microgrid).

10 When these microgrids are aggregated into a single ultimate grid, this
11 process could result in an ultimate grid with only a fractional customer.
12 Although it is difficult to be sure (because the BCPM preprocessing is not
13 easily reviewed), some portion of these fractional ultimate grids are
14 dropped before data is passed to the BCPM itself. This error within the
15 BCPM preprocessing clearly violates criteria number six of the FCC's
16 Universal Order, which requires that, "[t]he cost study or model must
17 estimate the cost of providing service for *all* businesses and *households*
18 within a geographic region." (emphasis added)

19

20

IV. THE BCPM DEFAULT SWITCHING METHOD

21

OVERSTATES COSTS AND THE TRANSPORT AND SIGNALING

1 **COSTS ARE BASED ON EMBEDDED DATA**

2

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

6

7 Q. **THE BCPM RUNS FILED BY BELLSOUTH AND SPRINT IN**
8 **THIS PROCEEDING RELY ONLY ON THE "BCPM METHOD"**
9 **FOR CALCULATING SWITCHING COSTS. DOES THIS**
10 **CONCERN YOU?**

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

18

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

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

5
6 **Q. HAVE OTHER STATE COMMISSIONS BEEN CRITICAL OF**
7 **THE BCPM SWITCHING COSTS?**

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

13 Both models can use the FCC switch cost as inputs,
14 but both use their own defaults. Mr. Legursky
15 analyzed the HM and BCPM switching modules to
16 determine whether either module produced results
17 in line with his knowledge of actual switching costs.
18 (Tr 974) He concluded that the HM's results were
19 "much better, but still conservative." (Tr 954)

20 Mr. Legursky acknowledged that the HM derived
21 switch costs from a regression curve calculated
22

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

10

11

The BCPM Transport and Signaling Calculations are Based on

12

Embedded Design, Not Forward-Looking Design

13

14

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

15

16

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).

17

18

19

20

21

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

9
10 **V. CALCULATION OF LOCAL LOOP COSTS**

11
12 *The Accurate Calculation of Local Loop Costs is Based on a Series of*
13 *Essential Steps*

14
15 **Q. WHAT ARE THE CRITICAL STEPS IN MODELING THE COST**
16 **OF THE LOCAL LOOP?**

17 **A.** The critical steps in this process are:

- 18 1) identifying residential and business customer locations in each
19 wire center;
- 20 2) aggregating these customers into efficient carrier serving areas and
21 distribution areas (distribution areas may be subsets of carrier

- 1 serving areas);
- 2 3) designing an efficient system of feeders and subfeeders to connect
- 3 each of the serving areas to the wire center, consistent with current
- 4 outside plant engineering practices;
- 5 4) locating properly the serving area interface ("SAI") and/or digital
- 6 loop carrier ("DLC") equipment in each serving area; and
- 7 5) designing an efficient system of distribution plant (backbone,
- 8 branch, and road cable) to connect customer locations to the
- 9 SAI/DLC equipment.

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

11

12 *In Direct Contrast to the HAI Model, The BCPM Fails to Accurately*

13 *Identify Customer Locations*

14

15 **Q. HOW DOES THE BCPM DETERMINE THE PHYSICAL**

16 **LOCATION OF CUSTOMERS FOR THE LOCAL LOOP?**

17 **A** As noted earlier, the BCPM makes no attempt to determine the physical

18 location of customers in designing its network. Instead, it relies upon a

19 series of allocations in order to distribute all customers in a Census Block

20 ("CB") to a grid network that is arbitrarily overlaid on each CB. The

21 BCPM allocation rules assume that customers should be assigned to each

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

5
6 The BCPM customer allocation assumptions are flawed for several
7 reasons. First, there is no reason to assume -- and no evidence to support
8 an assumption -- that each of the road types selected by the BCPM
9 developers for inclusion in the calculations has an equal probability of
10 serving basic local exchange customers. Logic suggests that
11 neighborhood streets are more likely to serve telephone customers than are
12 roads through national parks.

13
14 Second, except in neighborhood streets, it is unlikely that customers would
15 be evenly-distributed along the selected roadways. Our own day-to-day
16 observations tell us that customers tend to be clustered, rather than evenly-
17 dispersed along roadways. As is the case in any network industry, it is
18 more efficient (*i.e.*, less costly) to provide basic local exchange service to
19 customers that are grouped together than to serve customers that are
20 evenly dispersed. Thus, the BCPM base-line assumption that all
21 customers can be allocated to grids based upon road mileage is

1 unreasonable.

2

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

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

16

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

1 surrogate approach to *all* customer locations. This was done to identify
2 the extent to which the BCPM road surrogate assumption overstates the
3 true customer dispersion. In the lowest density zone (0 - 5 lines per square
4 mile), the first dataset generated a MST distance of 1,188 miles, while
5 using the second dataset (employing road surrogates for all customer
6 locations) generated a MST distance of 1,234 miles -- an increase of about
7 4%. For the second lowest density zone (5 - 100 lines per square mile),
8 the first dataset resulted in a MST distance of 9,310 miles, while using
9 road surrogates for all customer locations results in a MST distance of
10 10,102 miles -- an increase of approximately 9%. For the lowest two
11 density zones combined, using the BCPM assumption that all customers
12 are located along roads yields a MST result that is about 8% greater than if
13 actual geocoded data were incorporated.

14
15 The above percentages are a conservative estimate of the amount of
16 overstatement caused by the BCPM customer location assumptions,
17 because they reflect the effect of using road surrogates for only those
18 locations that originally were physically geocoded in the HAI Model. In
19 other words, changing the 34% of customer locations that were
20 successfully geocoded in the lowest density zone of the HAI Model to
21 road surrogate locations increases the MST distance by over 4%. We

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

8
9 Based on this analysis, we conclude that the assumption implicit in the
10 BCPM customer location process -- *i.e.* that it yields a useful estimate of
11 customer locations within a wire center -- is incorrect, because the BCPM
12 customer location process does *not* yield a reliable estimate of the
13 dispersion of customers within a wire center.

14
15 **Q. HOW DOES THE HAI MODEL LOCATE CUSTOMERS?**

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

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

7

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

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

15

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

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

5
6 **Q. DO YOU CONCLUDE THAT BOTH THE CB SURROGATE**
7 **METHODOLOGY USED BY THE HAI MODEL AND THE ROAD**
8 **SURROGATE METHODOLOGY USED BY THE BCPM**
9 **EXAGGERATE ACTUAL DISPERSION?**

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

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

4
5 **Q. HAVE THE BCPM SPONSORS PROVIDED ANY VALIDATION**
6 **OF THEIR CUSTOMER ALLOCATION ASSUMPTIONS?**

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

15
16 It certainly would be useful for BCPM to state (1) the number and percent
17 of actual customer locations that are located along the road types that are
18 mapped in the BCPM model; (2) a statistical measure indicating how
19 evenly these actual customer locations are dispersed along each of these
20 road types; (3) the number and percent of actual customer locations that
21 are located within the "road-reduced square," i.e., the quadrants in which

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

7

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

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

1 marketplace.

2

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

18

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

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

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

14
15 **Second, of course, is that the HAI Model's ability to locate one-third of the**
16 **customers in the lowest density area of Florida is clearly superior to the**
17 **BCPM, which locates no customers; and as we noted earlier, as geocoding**
18 **success rates improve in lower-density areas, overall customer location in**
19 **the HAI Model also will continue to improve.**

20
21 **As the following table demonstrates, the HAI Model geocoding success**

1 rate is relatively high in all density zones in Florida.

2
3

**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%

4

See Exhibit: _____ (DJW/BFP-6)

5

In its Order, the Louisiana Public Service Commission adopted the Staff's

6

Final Recommendation which reached a conclusion that is consistent with

7

our analysis:

8

It is interesting that while according to Dr. Duffy-Deno's

9

definition of rural, i.e., fewer than 20 housing units per square

10

mile, 104 of BellSouth's Louisiana wire centers would be

11

classified as rural, BellSouth's calculation of universal service

12

support shows support for every wire center it operates in

13

Louisiana. (Tr. 135, Martin Late-Filed Exhibit 1, BellSouth

14

Telecommunications, Inc. Response to FCC Data Request DA

15

97-1433 CC Docket 96-45, August 15, 1997, Questions 9 and

16

19.) Thus, to the extent that the Hatfield model more

17

accurately scales customers in other high cost areas, which

18

according to BellSouth's USF calculations all wire centers are,

19

the Hatfield model would produce a better cost estimate of

1 rving these areas than the BCPM that estimates the location
2 of customers in nonrural areas.

3
4 Based upon the evidence presented in the proceeding, Staff
5 believes that the Hatfield approach to locating nonrural
6 customers is superior to the BCPM's method that makes basic,
7 but reasonable, assumptions regarding customer location.
8 Nevertheless, the BCPM does not locate customers. The
9 Hatfield model's preprocessing process uses Metromail data
10 which contains addresses for 67.6% to 76% of the housing
11 units in Louisiana as of January 14, 1998. (BST Exhibit 4,
12 Duffy-Deno, Rebuttal, p. 6, AT&T Exhibit 1, Klick Rebuttal,
13 p. 28, and BellSouth Comments, p. 3.) Clearly, a model that
14 actually locates customers is more accurate than one that
15 estimates customer locations. Louisiana Public Service
16 Commission Staff's Final Recommendation at 7-8, March 30,
17 1998, footnotes deleted.

18
19 *The HAI Model Accurately Identifies Actual Groupings of Customers,*
20 *While the BCPM, By Using an Artificial "Grid" Overlay, Completely*
21 *Fails to Do So*

22
23 **Q. HOW DOES THE BCPM DETERMINE THE INDIVIDUAL**
24 **GEOGRAPHIC AREAS THAT THE NETWORK WILL SERVE?**

1 longitude and latitude rather than by principles of efficient
2 design. Thus, BCPM would serve a hypothetical group of
3 four adjacent households very differently depending on where
4 those households happen to be situated in relation to the
5 arbitrary gridlines that BCPM imposes. If entirely included in
6 one grid, all households in the group might be assigned to a
7 single Carrier Serving Area served by a single DLC terminal
8 and a single placement of subfeeder cable. If, however, the
9 same group of households "straddles" the BCPM gridlines,
10 that group would be assigned to as many as four different
11 CSAs, requiring four DLC terminals and four subfeeder
12 placements. Such an anomalous result does not reflect the
13 efficient, forward-looking design required by the FCC.

14 (Report of the Administrative Law Judge on Selection of Cost
15 Study, April 2, 1998, page 16, para 69)

16

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

1 structure to "trump" these considerations.

2

3 The superiority of the HAI Model approach was recognized by the
4 Kentucky Commission which stated that "the Commission determined that
5 the nature of the design of the HAI Model aligns itself with current
6 technology which is least-cost, most efficient and reasonable. The HAI
7 Model engineers the complete network, including the loop."⁴

8

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

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

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

3

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

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

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

5
6 **Q. DO YOU HAVE OTHER CONCERNS ABOUT USE OF THE GRID**
7 **STRUCTURE IN THE BCPM?**

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

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

4
5 Our understanding is that a serving area can be as large as 18,000 by
6 18,000 feet without violating the engineering requirement that every
7 customer in the carrier serving area be within 18,000 feet of the DLC. Of
8 course, this would require that the DLC be placed at the geographic center
9 of the serving area, rather than at the "road centroid" of the serving area
10 (as currently is done in the BCPM). Enlarging the serving area to these
11 dimensions would result in a serving area that is approximately 11.6
12 square miles -- 90 percent larger than the size of the average serving area
13 utilized by the BCPM. Thus, modification of the BCPM grid structure
14 from 1/25th of a degree of latitude and longitude to a grid structure set at
15 18,000 by 18,000 feet would permit a single carrier serving area (and,
16 therefore, a single DLC) to serve more than twice as much area and, on
17 average, twice as many customer locations in Florida.

18
19 **Q. WHILE EXPANDING THE SIZE OF THE SERVING AREA**
20 **WOULD THEORETICALLY ALLOW DLC EQUIPMENT TO**
21 **SERVE MORE CUSTOMERS, IS THERE A CONSTRAINT ON**

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

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

9
10 The BCPM developers assume that a single piece of DLC equipment can
11 handle as many as 1,000 customer locations, based on an assertion that
12 DLC equipment can handle a maximum of 1,344 lines. In our BCPM run
13 for the state of Florida, however, the average serving area contains 493
14 lines, only 50% percent of the figure that the BCPM developers assert is
15 the number of lines that can be served by a single piece of DLC
16 equipment. Furthermore, the BCPM results for Florida show 11,202
17 ultimate grids that serve fewer than 400 lines, or 48%. This is significant,
18 because a figure of 400 customers supposedly is used, in the BCPM
19 preprocessing, as a minimum threshold for microgrid aggregation.
20 Limiting the DLC equipment to a maximum of 1,000 lines also imposes
21 unrealistic restrictions on the engineering design and many efficiencies

1 which we understand can be realized by utilizing a 2,016 line DLC
2 (although the BCPM apparently was designed with the option to use a
3 2,016 line DLC, this option has been disregarded in the preprocessing
4 stages of the ultimate grid development).

5
6 The combination of these flawed design criteria within the BCPM
7 preprocessing creates serving areas that are too small and, therefore, that
8 serve an artificially small number of customers. The number of lines in
9 these serving areas could easily be doubled, thereby reducing the number
10 of serving areas. This would result in lower investment in DLC
11 electronics, feeder distribution interface ("FDI") equipment, and subfeeder
12 cable. The HAI Model run for Florida has only 11,280 serving areas --
13 fewer than one-half the number of ultimate grids in the BCPM (23,156
14 ultimate grids) -- without violating any of the outside plant constraints
15 required to provide basic local service. As a result, the BCPM places
16 twice as many DLC units than does the HAI Model, significantly
17 overstating costs to serve Florida customers.

18
19 *The BCPM is Based on an Inefficient Design for Feeder and Subfeeder*
20 *Facilities, Which Leads Directly to a Significant Overstatement of Costs*

21

1 concentrations once main feeder distance from the wire center exceeds
2 10,000 feet.

3

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

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

16

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

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

11
12 These anomalies in the BCPM's feeder design arise from what we believe
13 is a fundamental flaw in the BCPM's feeder pointing logic. In the BCPM,
14 structure must be built to each occupied grid, whether that grid contains a
15 single customer or thousands of customers. Unlike investment in copper
16 cable, feeder structure investment is not (with minor exceptions)
17 significantly affected by the number of customers in a grid or the
18 distribution of customers between grids (unless, of course, some grids are
19 entirely empty). As a result, attempting to minimize structure costs using a
20 process that takes into account the assumed customer population within
21 each grid effectively mis-specifies the optimization analysis. The result is

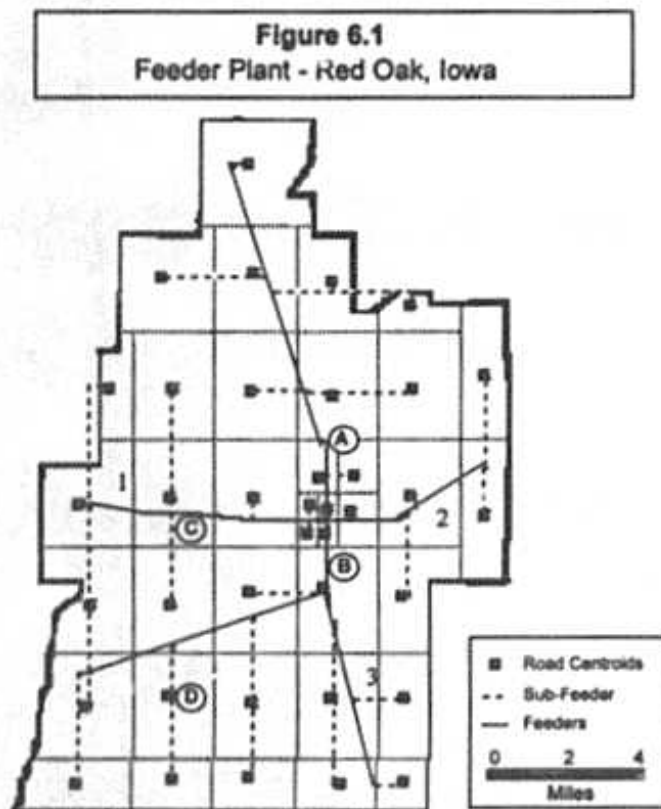
1 diagonal main feeders that would require more structure expense than
2 would a vertical or horizontal main feeder serving the same bisecting
3 subfeeder network.

4
5 **Q. APPARENTLY IN RESPONSE TO THIS CRITICISM, THE BCPM**
6 **NOW SOMETIMES USES RECTILINEAR ROUTING FOR ITS**
7 **FEEDER CONFIGURATION. DOES THIS SOLVE THE**
8 **PROBLEM?**

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

19
20 Although the BCPM developers claim that the current version of the
21 model selects the most efficient feeder/subfeeder routing, Figure 6.1 in

1 their own documentation suggests otherwise. Below, we have reproduced
 2 Figure 6.1 from page 36 of the BCPM 3.0 documentation (it is our
 3 understanding that the feeder design has not changed between the BCPM
 4 3.0 and the BCPM 3.1, and the figure of the feeder plant for Red Oak,
 5 Iowa has been removed from the BCPM 3.1 documentation -- even though
 6 all of the other illustrations in the documentation still use Red Oak, Iowa),
 7 and superimposed three numbers indicating inefficiencies in the
 8 feeder/subfeeder routing that we wish to discuss.



9

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

8
9 In short, the problem is that the BCPM's feeder pointing algorithms should
10 be (1) modified to eliminate their sensitivity to customer concentration and
11 to consider, instead, the concentration of carrier serving areas and the
12 distance of serving areas that must be reached by the feeder, (2) modified
13 to eliminate the "bush" feeder design when a decision is made to split
14 main feeder, and (3) modified to determine the most efficient design on a
15 feeder-by-feeder basis, rather than a wire center basis.

16
17 In contrast, the HAI Model appropriately (1) lets the user select whether or
18 not to steer feeder, (2) seeks to optimize the steering by taking the cluster's
19 distance from the central office into account, and (3) allows the user to
20 specify an air-to-route ratio.

21

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

16
17 In contrast, the HAI Model constructs its distribution plant in geographic
18 areas that resemble the actual physical locations of customers. To
19 facilitate modeling, the HAI Model converts each serving area into a
20 rectangle. In doing so, however, it preserves the basic area, shape and
21 location of the physical cluster of customers, thereby preserving the

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

8
9 **Q. IN YOUR OPINION, ARE THE HAI MODEL CLUSTERS A MORE**
10 **REASONABLE DEPICTION OF WHERE CUSTOMERS ARE**
11 **ACTUALLY LOCATED THAN THE BCPM ROAD-REDUCED**
12 **DISTRIBUTION QUADRANTS?**

13 **A.** It is clear to us that the HAI Model clusters more closely depict locations
14 where customers are than do the BCPM square, road-reduced distribution
15 quadrants. While it is true that the HAI Model could be modified to
16 ensure that the underlying cluster characteristics are not limited to a North-
17 South, East-West orientation, AT&T's and MCI's FCC filing (attached as
18 Exhibit: _____ (DJW/BFP-7)) shows that (1) for any given study area, the
19 maximum change in basic local service cost that would result from
20 eliminating the North-South, East-West orientation requirement would be
21 -0.84%, (2) the maximum upwards adjustment for the 17 study areas

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

5
6 In other proceedings, the BCPM proponents have claimed that the HAI
7 Model convention of employing an aspect ratio to estimate cluster shape is
8 appropriate only for those clusters whose longest axis is nearly North-
9 South or East-West.¹⁰ While we agree that limiting cluster orientation in
10 the HAI Model to North-South, East-West is not ideal, we disagree with
11 this assessment that use of an aspect ratio is not reasonable -- it is far
12 superior to the distribution areas created by the BCPM, which always are
13 square and may be geographically located far from the underlying
14 customer locations, particularly in rural areas most likely to require USF
15 support.

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

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

13
14 **Q. IS IT CORRECT, AS THE BCPM PROPONENTS OFTEN CLAIM,**
15 **THAT THE HAI MODEL DATABASE DOES NOT CONTAIN ANY**
16 **OF THE SPECIFIC HOUSEHOLD AND BUSINESS LOCATIONS**
17 **ORIGINALLY USED IN THE HAI MODEL PREPROCESSING TO**
18 **FORM THE CLUSTERS?**

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

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

6
7 While modeling assumptions may result in some of the HAI Model
8 locations falling outside of the rectangular clusters, and some of the
9 BCPM locations falling outside of the BCPM road-reduced distribution
10 areas, the HAI Model does a better job of establishing realistic distribution
11 areas because it centers the distribution areas on customer locations and its
12 distribution areas equal the area comprised of the actual customer
13 locations.

14

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

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

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

18
19 **Q. HOW DOES THE BCPM MODEL ACTUALLY SERVE THE**
20 **CUSTOMERS IN THE LOWER LEFT QUADRANT OF THE**
21 **ULTIMATE GRID IDENTIFIED WITH A FDI CODE OF 2011178?**

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

15
16 This example highlights a serious and significant problem with the BCPM
17 -- this "capping" methodology prevents the BCPM from constructing
18 enough plant to serve customers at the road-reduced quadrant locations
19 where prior analytical steps in the model have placed them. In other
20 words, the BCPM methodology does not place plant to serve these
21 customers *either* (1) on the road to which they were originally allocated, or

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

11

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

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

17

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

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

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

8
9 Just as square lots would require a developer to install more road feet and
10 driveway feet per household, as shown in Exhibit: _____ (DJW/BFP-14)
11 assuming square lots in the BCPM requires more outside plant to be
12 installed to reach these households. Because the real estate developers
13 should have the same incentives as the telecommunications providers, *i.e.*,
14 to reduce infrastructure costs, the HAI Model's use of rectangular lots is
15 the more logical modeling assumption than the BCPM's use of square lots
16 which is not supported by any evidence and serves to overstate costs (the
17 HAI Model does not assume rectangular lots for outlier clusters, but
18 recognizes that these customers are located along roads).

19
20 **Q. CAN YOU SUMMARIZE THE DEFICIENCIES IN THE BCPM'S**
21 **OUTSIDE PLANT DESIGN?**

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

5

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

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

17

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

21

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

10

11

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13

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21

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

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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		
Total Distribution	102,096	98,190
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

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14

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

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

7
8 In addition, the feeder portion of the BCPM network is significantly
9 greater than the HAI Model feeder route miles. As Exhibit: _____
10 (DJW/BFP-17) illustrates, per-foot structure costs associated with the
11 feeder portion of the network are substantially more expensive than the
12 structure associated with the distribution portion of the network, due
13 largely to the different mix of structure (e.g. aerial, buried, and
14 underground) between feeder and distribution. By using excessively small
15 serving areas in the BCPM methodology, the BCPM developers have
16 overstated investment both by placing excessive DLC equipment and by
17 artificially shifting the mix of structure from distribution to the more
18 expensive structure mix associated with feeder plant.

19
20 **Q. WHAT ARE THE IMPLICATIONS OF THESE COMPARISONS?**

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

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

5
6 **Q. HAVE OTHER REGULATORY AGENCIES COMPARED THE**
7 **CUSTOMER LOCATION AND ENGINEERING DESIGN**
8 **ASPECTS OF THE HAI AND THE BCPM MODELS?**

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

13
14 **Q. IN OTHER JURISDICTIONS, THE BCPM SPONSORS HAVE**
15 **CONTENDED THAT APPLICATION OF A MINIMUM**
16 **SPANNING TREE ANALYSIS HAS DEMONSTRATED THAT**
17 **THE HAI MODEL FAILS TO BUILD SUFFICIENT**
18 **DISTRIBUTION PLANT. IS THE MST DISTANCE A VALID**
19 **BASIS FOR ASSERTING A GENERALIZED CLAIM THAT THE**
20 **HAI MODEL BUILDS TOO LITTLE CABLE?**

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

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

4 The claim that a MST should be the *minimum* amount of distribution cable
5 installed in a cluster also is wrong for at least two important reasons.

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

18
19 In addition, the BCPM sponsors have conceded in other jurisdictions (*e.g.,*
20 *Minnesota and Texas*) that the Steiner tree, not the MST, constitutes the
21 minimum distance required to connect a series of points in a network --

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

3
4 A third conceptual issue with the MST analyses that have been undertaken
5 to date by the BCPM sponsors is that they do not include the digital loop
6 carrier ("DLC") and feeder/distribution interfaces as nodes that must be
7 connected by any MST or Steiner tree. To create a functional network, it
8 is obvious that the various customer locations in a distribution area must
9 be connected not only to each other, but to the rest of the network as well.

10 Because this connection takes place through the DLC and/or FDI nodes,
11 these locations could have been included as part of the MST calculation --
12 failure to do so can understate the required MST distance. However, in
13 order to minimize potential differences between the parties' presentations,
14 the MST analyses that we provide with this testimony also *excludes* the
15 DLC/FDI nodes from the calculations, consistent with the approach used
16 by the BCPM proponents.

17

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

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

1 produced approximately 18 percent *more* backbone and branch cable than
2 did the BCPM. The HAI Model produced more backbone and branch
3 cable than did the BCPM for 382 of the 470 wire centers studied (or 81%).

4 In short, the HAI Model constructs significantly more cable to reach
5 customers in the distribution areas than does the BCPM -- a fact that is
6 inconsistent with claims made by the BCPM sponsors that the HAI Model
7 fails to construct sufficient cable to "connect the dots" in distribution areas
8 (for the reasons articulated earlier, we believe that the appropriate
9 comparison of the two models is a comparison of backbone and branch
10 cable; however, a comparison of *all* distribution cable also confirms that
11 the HAI Model constructs sufficient cable. See Exhibit: _____
12 (DJW/BFP-16)).

13
14 **Q. HOW ARE THE MST ANALYSES THAT YOU ARE PRESENTING**
15 **ORGANIZED?**

16 **A.** We have performed a MST analysis for a subset of BellSouth wire centers
17 in Florida -- the wire centers for which we have been provided both the
18 HAI Model MST distances and the BCPM microgrid data. The MST
19 analyses described below are based on 124 BellSouth wire centers (these
20 124 wire centers represent all wire centers that matched up with
21 BellSouth's initial data response, with the following exceptions: (1) we

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

2

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

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

12

13 The problems caused by the BCPM customer location assumptions are
14 particularly acute in low density areas because population is sparse and
15 CBs are geographically large, covering numerous microgrids (which are
16 1,500 feet by 1,700 feet in size). Under the BCPM approach, in which a
17 CB's customers are distributed to all microgrids that have qualifying road
18 types traversing them, the small number of customers in a CB are
19 allocated to a large amount of road mileage, resulting in many microgrids
20 with fractional customer allocations. Even microgrids that are allocated
21 more than a single customer contain fractional customers, and *none* of

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

6
7 With regard to microgrids containing only a fraction of a customer, we
8 have employed an algorithm that totals all fractional customers in the
9 microgrids comprising a quadrant, and then allocates this number of
10 customers to a portion of the quadrant's microgrids from which these
11 fractional customers are drawn. This approach is conservative, because it
12 tends to concentrate customers that the BCPM would otherwise disperse
13 over a larger number of microgrids. For example, the BCPM process for
14 calculating the amount of distribution plant that must be constructed is
15 based on a 500-foot buffer on either side of all included road feet in all
16 populated microgrids, even if a microgrid is occupied by only a fraction of
17 a customer. The total area generated by this road buffer ultimately is
18 divided by the number of customers in these microgrids to generate the
19 average lot size, which in turn determines the drop length that is calculated
20 by the model. Comparing the amount of distribution plant generated by
21 the BCPM, including drop lengths, to our MST distances -- which

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

7
8 Having made that decision, we then had to address where in the microgrid
9 we would physically locate each of the allocated customers. We decided
10 to assume, for MST purposes, that all customers assigned to a microgrid
11 are evenly distributed throughout a road-reduced area of the microgrid.
12 This approach is consistent with the assumptions made by the BCPM in
13 designing distribution plant within quadrants. These assumptions are that
14 (1) the area served equals 1,000 feet times the amount of road distance in
15 the microgrid, with a maximum area equal to the area of the microgrid, (2)
16 customers are evenly distributed throughout the area served, (3) lots are
17 square, and (4) housing units are located in the center of lots. Exhibit:
18 _____ (DJW/BFP-11) provides a visual representation of this process.

19
20 **Q. HOW DOES YOUR MST ANALYSIS COMPARE WITH THE MST**
21 **ANALYSES PREVIOUSLY PERFORMED BY THE BCPM**

1 **PROPONENTS?**

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

12
13 In addition, the MST analyses that have been conducted by the BCPM
14 proponents for the BCPM have been inconsistent with the analyses they
15 have undertaken for the HAI Model.

16
17 **Q. HOW HAVE THE MST ANALYSES ON THE BCPM**
18 **CONDUCTED BY THE BCPM PROPONENTS DIFFERED FROM**
19 **THEIR MST ANALYSES ON THE HAI MODEL?**

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

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

10
11 **Q. WHAT ARE THE RESULTS OF YOUR ANALYSES?**

12 A. The results of our MST analyses for the 124 Bell South wire centers are
13 summarized by density zone in Exhibit: _____ (DJW/BFP-18) and are
14 summarized by wire center in Exhibit: _____ (DJW/BFP-19). The
15 analyses show that for the lowest density zone, the HAI Model estimated
16 distance falls 24 percent short of the MST distance, while the BCPM
17 estimated distance falls more than 38 percent short of the MST distance.
18
19 For the next lowest density zone, the HAI Model distance actually *exceeds*
20 the MST distance by more than 30 percent while the BCPM exceeds the
21 MST distance by only 13 percent. For the lowest two density zones

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

10

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

15

16

17

VI. THE INPUTS TO THE BCPM USED BY THE INCUMBENT

18

LOCAL EXCHANGE COMPANIES CAUSE A FURTHER

19

OVERSTATEMENT OF THE COSTS THAT WOULD BE

20

INCURRED BY A MORE EFFICIENT CARRIER

21

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

3 A. The determination of the "total forward looking cost... of providing basic
4 local telecommunications service" as required by F. S. 364.025 (4) (b) is a
5 two step process. First, the cost model to be used must be constructed in
6 such a way that generally accepted design and placement principles and
7 the most recent commercially available technology and equipment are
8 used to model the characteristics of a network that would be deployed by
9 an efficient provider of local telecommunications services. The second
10 step is a determination of the investment that will be required and the
11 ongoing expenses that will be incurred to own and operate such a network.

12 In order to complete this second step, assumptions must be made
13 regarding the acquisition costs of material and labor, the level of operating
14 expenses, the level of capital related costs, certain operational
15 characteristics of the network (the level of utilization of investments, for
16 example), and the opportunities that may exist to reduce total costs by
17 sharing investments or expenses with other firms.

18
19 Previous sections of this testimony have focused on the first step of
20 determining the characteristics of the network required to provide local
21 telecommunications service in a given geographic area. This section

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

7
8 **Q. DON'T ALL COMPANIES AGREE THAT THE COSTS TO BE**
9 **CALCULATED ARE THOSE THAT WOULD BE INCURRED BY**
10 **AN "EFFICIENT CARRIER"?**

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

18
19 BellSouth witness Caldwell, for example, states that the cost model
20 adopted by the Commission in this proceeding should be used "with the
21 appropriate inputs to identify the costs that an efficient provider would

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

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

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

1 Q. DO THE BELL SOUTH AND SPRINT WITNESSES ARGUE FOR
2 THE INCLUSION OF SUCH "COMPANY SPECIFIC" COSTS?

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

10

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

21

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

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

16
17 **The specifics of many of the industry changes are described in the**
18 **testimony of Sprint witness Dr. Staihr. He correctly points out at page 9**
19 **that "historical or book costs reported over many years do not reflect the**
20 **efficiencies that can be realized today in the provision of basic service.**
21 **They also do not reflect the realities of today's market with regard to, for**

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

9
10 Second, while she has had a distinguished career at BellSouth, Ms.
11 Caldwell's professional experience is limited to examinations of the costs
12 of a regulated monopoly; she does not have comparable experience
13 evaluating the costs of a firm operating in competitive markets. As a
14 result, she simply lacks the necessary foundation to reach her oft-stated
15 conclusion that BellSouth's existing cost structure is equal to the cost
16 structure of an efficient provider on a going forward basis.

17
18 **Q. YOU STATED THAT COSTS SHOULD BE SPECIFIC TO THE**
19 **GEOGRAPHIC AREA BEING STUDIED. IT IS NECESSARY FOR**
20 **ALL MODEL INPUTS TO BE CHANGED TO FLORIDA-**
21 **SPECIFIC VALUES IN ORDER TO ACCOMPLISH THIS**

1 **OBJECTIVE?**

2 A. No. In a further attempt to justify the use of historic and embedded (i. e.
3 "Company specific") information as cost model inputs, the incumbent
4 LEC witnesses have attempted to frame the debate as a choice between
5 "state-specific" and "default" input values. In this dichotomy, "state
6 specific" is simply a euphemism for historic information from the
7 Company's records. The objective of the process should be to produce
8 costs that are specific to a given area. In order to do so, it will be
9 necessary to use a mixture of geographic and input data that is highly
10 specific to the geographic area being studied (soil type, for example) and
11 input values that are not specific to the geographic area or even to the state
12 (the purchase price of materials that BellSouth purchases on a regional
13 basis, for example). As Sprint witness Staihr correctly points out at page
14 13, "just as the values of certain inputs should and will change from
15 location to location, others will not."
16 As a result, it is necessary to evaluate all model inputs in order to
17 determine whether they are representative of the costs that would be
18 incurred by an efficient provider. Much of this information must be
19 specific to the area being studied. In many cases, however, so-called
20 "default" data represents the most reliable and objective information, while
21 so-called "company specific" inputs are based on high cost practices that

1 would not be sustainable in a competitive marketplace.

2

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

4 *Environment*

5

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

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

- 1 meeting increasing environmental constraints;
- 2 2) U. S. computer chip makers have embarked on a joint effort to
3 create smaller chips by using obsolete U. S. Government bomb
4 facilities (Washington Post, 9/11/97 business section);
- 5 3) TeleWest, a joint venture between U S WEST and
6 TeleCommunications, Inc. ("TCI") in the United Kingdom,
7 combines telephone and cable service to achieve substantial cost
8 savings. A discussion of the network structure, on page 3 of U S
9 WEST's January 1993 Investors Report, states that:
- 10 TeleWest is installing an advanced hybrid network that
11 includes twisted copper pairs, fiber optics and coaxial
12 cable. This is a state-of-the-art cable TV network with
13 fiber to nodes serving 2,000 homes and coaxial cable
14 extending beyond to nodes and into the homes. Laid along
15 side the cable TV network is the latest telephone digital
16 loop carrier network, which runs fiber to the nodes serving
17 500 homes. Copper wire extends beyond the nodes and
18 into the homes. As shown below, the two networks overlay
19 each other, sharing a common power supply, conduit and
20 trench.
- 21 4) Airports and ocean ports, in which companies that compete fiercely
22

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

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

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

18
19 These are just a few of the ways in which competitors are pooling
20 resources and sharing facilities and talent to provide better quality services
21 to customers and to lower products' costs.

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

16

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

19

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

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

4 A. In order to suggest that the HAI Model's customer location algorithm is
5 flawed, the BCPM sponsors claim that Metromail's National Consumer
6 Database ("NCDB") contains only 70 million named and unnamed address
7 records for the 50 states (65 percent of the addresses). This assertion is
8 simply wrong. Attached, as Exhibit: _____ (DJW/BFP-20), is a
9 memorandum from Kevin Wiesep of Metromail refuting the BCPM
10 sponsors statistics. In his memorandum -- which was filed by AT&T/MCI
11 with the FCC in CC Docket No. 96-45 in December, 1997 -- Mr. Wiesep
12 states that "[t]he Metromail database does have over 90% (approximately
13 91.5%) of the residential addresses in the U.S." Of this 91.5%, the
14 Centrus® Desktop software used in the HAI Model customer location
15 process successfully geocodes approximately 71% of the residences
16 nationally.

17
18 In contrast, the BCPM process cannot identify the actual physical location
19 of a single customer. These sorts of statistics are most meaningful only in
20 comparison to comparable statistics for the other models before the
21 Commission. As we noted earlier, it would be useful for the BCPM

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

14
15 **Q. IN WHAT OTHER WAYS HAVE THE BCPM SPONSORS MADE**
16 **MISLEADING COMPARISONS REGARDING THE HAI MODEL?**

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

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

5
6 **Q. WHAT ARE YOUR CONCLUSIONS ON THE RELATIVE**
7 **MERITS OF THE COMPETING METHODOLOGIES USED BY**
8 **THE BCPM AND THE HAI MODEL TO LOCATE CUSTOMERS?**

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

21

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

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

6
7 Attached, as Exhibit: _____ (DJW/BFP-21), is a simple comparison of
8 annual charge factors resulting from the HAI Model and the BCPM, using
9 consistent input assumptions for taxes, cost of capital, economic life, and
10 salvage values. This shows that the HAI Model, by not incorporating the
11 benefits of deferred taxes, produces annual capital costs that are more than
12 fifteen percent higher than those produced by the BCPM when consistent
13 inputs are used.

14
15 We find it curious that the BCPM developers, after examining the HAI
16 Model in some detail, have never pointed out this discrepancy in
17 methodology -- a discrepancy that would serve to lower the HAI Model
18 estimated costs and the amount of USF support.

19
20
21

1 **VIII. FINDINGS AND CONCLUSIONS**

2

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

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

11 **Following is a summary of the problems with the BCPM:**

- 12 1) The BCPM does not locate any customers.
- 13 a) The BCPM does use geocoded data.
- 14 b) The BCPM drops customers and therefore does not provide
- 15 universal service.
- 16 c) The BCPM assumes that all customers are evenly
- 17 distributed along a selected subset of roads without any
- 18 evidence supporting that assumption -- an assumption that
- 19 overstates dispersion.
- 20 2) The BCPM distribution areas are unrealistic.
- 21 a) The BCPM assumption that all distribution areas are square

- 1 is overly-simplistic.
- 2 b) The BCPM assumption that the area of the road-reduced
3 square equals 1,000 feet times the road length is
4 unsupported and arbitrary.
- 5 c) The BCPM road-cap leaves many customers unserved by a
6 workable network.
- 7 d) The BCPM assumption that customers live on square lots is
8 unsupported and overstates costs.
- 9 3) The BCPM carrier serving area design is inefficient.
- 10 a) The BCPM "cookie cutter" approach is arbitrary, and does
11 not take into account actual customer clustering.
- 12 b) The BCPM serving areas are too small to efficiently use
13 DLC.
- 14 c) The BCPM grid approach inconsistently treats various parts
15 of the country.
- 16 4) The BCPM does not use a least-cost feeder plant design.
- 17 a) The BCPM mis-specifies the cost-minimizing optimization
18 algorithm by steering feeder toward the population
19 centroid.
- 20 b) The BCPM subfeeder cable is not always perpendicular to
21 the main feeder.

- 1 documented and readily-adjustable;
- 2 5) develops costs for both UNEs and USF on a consistent basis;
- 3 6) includes a forward-looking and long-run perspective; and
- 4 6) satisfies the FCC criteria and F. S. 364.025 (4) (b).
- 5

6 We urge the Commission to evaluate the cost proxy models proposed by

7 the parties with the understanding that similar inputs generally can be used

8 in either model. Contrary to the past testimony of many ILEC witnesses,

9 which has focused on model inputs, the deficiencies of the BCPM

10 demonstrate that the methodology does matter. The substantive flaws that

11 have been identified in the BCPM overstate costs and are difficult to

12 modify. The HAI Model does not suffer from these same deficiencies, and

13 is clearly the more reliable model.

14

15 **Q. ARE THERE OTHER CONSIDERATIONS THIS COMMISSION**

16 **SHOULD TAKE INTO ACCOUNT WHEN SELECTING A**

17 **METHODOLOGY FOR THE DETERMINATION OF UNIVERSAL**

18 **SUPPORT FUNDING?**

19 A. Yes. In addition to the fact that the HAI Model actually locates customers

20 and designs its outside plant based on the locations of the customers, the

21 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.*

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

3 CHAIRMAN JOHNSON: Okay. BellSouth.

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

6 CHAIRMAN JOHNSON: Okay. Mr. Williams.

7 MR. CARVER: Thank you.

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

10 CROSS-EXAMINATION

11 BY MR. WILLIAMS:

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

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

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

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

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18 you confirm the accuracy of what we were talking about
19 yesterday?

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21 your numbers, but I think they are very close and I would
22 call those comparable to being correct; yes.

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

1 we were here and considering version 2.2.2?

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

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

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

8 A (Witness Wood) Yes, ma'am.

9 BY MR. WILLIAMS (Continuing):

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

12 A (Witness Wood) Yes.

13 (Witness Pitkin) Yes.

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

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

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

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

24 Q You want that one?

25 A (Witness Wood) Sure.

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

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

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

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

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

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

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

22 Q Right.

23 A (Witness Wood) That's right.

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

1 A (Witness Wood) That's right.

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

5 A (Witness Wood) I'm not sure.

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

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

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

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

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

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

22 Yes.

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

1 A (Witness Pitkin) Yes.

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

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

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

11 A (Witness Pitkin) Yes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

18 COMMISSIONER CLARK: Mr. Wood, is that correct?

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

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

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

7 COMMISSIONER CLARK: All locations with a
8 telephone?

9 A (Witness Wood) That's correct.

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

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

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

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

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

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

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

8 COMMISSIONER CLARK: This is only housing units?

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

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

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

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

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

1 line counts that are provided by the local companies.

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

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

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

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

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

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

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

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

21 COMMISSIONER CLARK: Okay. Thanks.

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

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

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

9 MR. WILLIAMS: All right. Thank you.

10 BY MR. WILLIAMS (Continuing):

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

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

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

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

25 A Yes.

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

3 A (Witness Pitkin) Yes.

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

7 A (Witness Pitkin) Yes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4 A (Witness Pitkin) No.

5 Q Okay. Thank you.

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

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

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

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

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

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

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

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

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

7 But there aren't a lot of residences in the
8 10,000-plus zone to geocode in the first place. Those are
9 office buildings almost exclusively. It's the only way to
10 stack that many lines in a small space.

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

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

25 A (Witness Wood) Yes.

1 Q Do we have context there?

2 A (Witness Wood) Yes, we do.

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

8 Is that you, Mr. Pitkin?

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

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

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

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

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

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

3 Q I thought that's what you said earlier.

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

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

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

10 Q Now early in your testimony -- this is on page
11 14; you may look, if you wish -- you stated or Mr. Pitkin
12 stated, and I think we can certainly agree here, that
13 issues that do not constitute significant differences
14 between the models should not be the primary focus of this
15 proceeding.

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

20 A (Witness Wood) Absolutely.

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

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

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

4 Q Using your correction, I'm fine.

5 A (Witness Wood) Yes.

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

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

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

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

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

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

1 Q Eighty or ninety percent of the costs are --

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

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

7 A (Witness Wood) Yes.

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

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

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

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

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

24 A (Witness Wood) For distribution facilities, yes.

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

1 they significant?

2 A (Witness Wood) For feeder, yes.

3 Q Rights of way; are they big ticket items?

4 A (Witness Wood) Depends; they can be.

5 Q Land and buildings?

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

8 Q Very low?

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

15 Q What about labor; is labor a significant cost?

16 A (Witness Wood) Yes.

17 Q Any other significant costs we should add there?

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

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

1 A (Witness Wood) Yes.

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

5 Do you see that question?

6 A (Witness Wood) I do.

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

10 A (Witness Wood) Yes.

11 Q Is that a fair characterization?

12 A (Witness Wood) It is indeed.

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

20 A (Witness Wood) That's correct.

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

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

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

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

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

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

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

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

1 monopoly rate of return regulation.

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

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

11 A (Witness Wood) Yes.

12 Q All right. Thank you.

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

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

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

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

1 efficient purchasing practices?

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

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

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

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

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

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

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

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

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

14 A (Witness Wood) All right.

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

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

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

1 purchase price.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

8 Q Outside plant engineering team?

9 A (Witness Wood) Yes.

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

12 A (Witness Wood) He is.

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

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

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

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

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

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

15 A (Witness Wood) Yes.

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

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

1 get around to developing inputs based on books of account.

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

4 A (Witness Wood) Yes.

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

11 A (Witness Wood) Yes.

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

19 A (Witness Wood) Yes.

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

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

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

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

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

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

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

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

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

1 components in the loop.

2 A (Witness Wood) All right.

3 Q All right?

4 A (Witness Wood) All right.

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

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

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

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

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

17 A (Witness Wood) No, sir.

18 Q No?

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

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

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

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

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

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

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

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

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

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

1 A (Witness Wood) Yes, it has.

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

5 A (Witness Wood) Well, for the pole.

6 Q At least to dig a hole?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4 Q But they are --

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

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

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

16 A (Witness Wood) I have.

17 Q And do you endorse those?

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

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

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

4 A (Witness Wood) Absolutely.

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

7 A (Witness Wood) Yes, I did.

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

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

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

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

16 Q That does not concern you, I take it?

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

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

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

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

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

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

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

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

13 Q They did interview him.

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

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

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

21 Q Thank you.

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

25 A (Witness Wood) Yes.

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

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

6 Q Higher than.

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

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

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

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

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

1 Washington Order.

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

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

6 Q Well, then do you recall --

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

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

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

18 Q I'm sorry. I thought you had.

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

21 A (Witness Wood) Yes.

22 Q Is that you?

23 A (Witness Wood) Yes.

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

1 A (Witness Wood) That's correct.

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

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

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

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

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

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

1 A (Witness Wood) Yes.

2 Q And Mr. Riolo?

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

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

15 A (Witness Wood) That's correct.

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

18 A (Witness Wood) Labor costs.

19 Q Labor costs; yes.

20 A (Witness Wood) Yes.

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

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

25 Q So all of the labor components then in the

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

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

5 Q I understand.

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

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

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

13 Q I'm just talking about the labor component.

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

16 Q Understood.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

24 A (Witness Wood) Yes.

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

1 rate from New York?

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

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

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

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

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

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

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

22 Q That's right. I think we do.

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

1 A (Witness Wood) Yes.

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

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

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

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

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

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

1 anything remotely to do with New York.

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

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

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

9 A (Witness Wood) Yes.

10 Q Is that something I can direct to you?

11 A (Witness Wood) Yes, you can.

12 Q What is it, first of all?

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

16 Q What are the components of network operations?

17 A (Witness Wood) I've got -- Hold on. There is an
18 appendix to the Hatfield Inputs Portfolio. It's Appendix
19 D, that lists the accounts that are involved. It's 6512,
20 network provisioning; 6531, power; 6532, network
21 administration; 6534, plant operation administration; and
22 6535, engineering.

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

25 A (Witness Wood) Yes, it has.

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

3 A (Witness Wood) I don't.

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

8 CHAIRMAN JOHNSON: Is that something to be --

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

13 CHAIRMAN JOHNSON: Okay.

14 BY MR. WILLIAMS (Continuing):

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

17 A (Witness Wood) I am.

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

20 A (Witness Wood) I have.

21 Q Have you seen this document before?

22 A (Witness Wood) I have.

23 Q I'm sorry; you have?

24 A (Witness Wood) I have.

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

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

3 A (Witness Wood) He is.

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

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

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

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

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

25 Q Who assigned him this task of doing whatever he

1 was supposed to do?

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

4 Q Excuse me?

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

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

9 A (Witness Wood) Yes.

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

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

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

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

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

1 process at all that we used to develop the factor.

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

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

7 Q Right.

8 A (Witness Wood) He was right about that.

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

13 A (Witness Wood) In total, yes.

14 Q In total?

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

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

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

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

25 A (Witness Wood) All right.

1 Q Okay. And then what happened was Hatfield 3.1
2 is released and the network operations factor is reduced to
3 50%?

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

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

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

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

12 A (Witness Wood) No.

13 Q Are you sure about that?

14 A (Witness Wood) Positive about that.

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

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

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

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

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

7 A (Witness Wood) No; as support for.

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

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

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

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

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

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

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

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

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

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

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

13 Q All right.

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

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

24 A (Witness Wood) No problem.

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

1 problem here.

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

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

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

15 A (Witness Wood) Yes.

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

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

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

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

1 Q Thank you.

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

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

7 Pass the witness.

8 CHAIRMAN JOHNSON: BellSouth.

9 MR. WILLIAMS: Or witnesses, I should say.

10 MR. CARVER: Thank you, Madam Chairman.

11 CROSS-EXAMINATION

12 BY MR. CARVER:

13 Q Good afternoon, Misters Wood and Pitkin.

14 A (Witness Pitkin) Good afternoon.

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

16 Q My name is Phil Carver. I represent BellSouth.

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

21 A (Witness Wood) Yes, sir.

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

1 A (Witness Wood) Yes.

2 Q And which version of Hatfield was being
3 considered?

4 A (Witness Wood) I do not recall the specific
5 version. It's on -- It's part of what's on the FCC website
6 in terms of the Nevada recommendation, but I don't remember
7 offhand the exact vintage of the proceedings or which
8 version would have applied.

9 Q Could it have been 4.0?

10 A (Witness Wood) It could have been.

11 Q It definitely wasn't 5.0?

12 A (Witness Wood) It certainly was not this current
13 version of 5.0; no.

14 Q Okay. It might have been a earlier version of
15 5.0?

16 A (Witness Wood) My recollection of the timing of
17 the Nevada proceeding is that that's unlikely. I don't
18 think it was ready then, but I don't know for sure. But it
19 wasn't this current version of either of these models.

20 Q So it was probably 4.0 or earlier then?

21 A (Witness Wood) Again, that's my best guess, but
22 I'd be glad to look that up for you. It's on the website.

23 Q Now 4.0 did not utilize geocoding; did it?

24 A (Witness Wood) That's right.

25 Q So the model, the version of the Hatfield model,

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

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

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

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

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

24 A (Witness Wood) There are several; yes.

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

1 specifically the citations to Kentucky and to Louisiana.

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

4 Q (Witness Wood) That would be me.

5 Q Okay. Let's focus on Louisiana first of all.
6 Although Louisiana adopted Hatfield as a platform, it
7 rejected most of the Hatfield inputs; isn't that true?

8 A (Witness Wood) No. It decided to modify a
9 handful of Hatfield inputs.

10 Q Okay.

11 A (Witness Wood) I've got the order right here.

12 Q Okay. In terms of the significant -- Those
13 handful that were modified -- And I'm just accepting your
14 characterization for purposes of the question. I don't
15 necessarily agree it was a handful. We'll get to that
16 later.

17 But as to the ones that were modified, those were
18 all significant cost drivers; were they not?

19 A (Witness Wood) Some were; some weren't. And some
20 had an impact on costs. Some were far less significant.
21 There was a range.

22 Q Well, I have a number of questions about the
23 particular inputs that were modified. And you tell me how
24 to proceed. These are engineering inputs, but my questions
25 are keyed to the Louisiana order.

1 A (Witness Wood) Okay. I have the order if you
2 want to refer me to it, I'll be glad --

3 Q I was just going to ask, since they're input
4 questions that relate to that order that's cited in your
5 testimony, should I direct that to you or to Mr. Pitkin or
6 to Mr. Wells later?

7 A (Witness Wood) I believe the answer is to me. If
8 you have a specific engineering problem, I'll let you know
9 and I will suggest Mr. Wells. But at this point I think
10 it's me.

11 Q Okay. Before we start on the specifics, just one
12 thing I want to clarify, just so that we get our references
13 straight. In Louisiana there was a rather lengthy staff
14 recommendation and then a short Commission order adopting
15 that recommendation; is that correct?

16 A (Witness Wood) That's correct.

17 Q Okay. So when I refer to the Staff
18 recommendation, that in this instance is synonymous with
19 the order; understood?

20 A (Witness Wood) I understand you intend it that
21 way; yes.

22 Q And would you agree with me that that's a fair
23 characterization?

24 A (Witness Wood) Well, certainly if you're going to
25 understand the order, you have to have the Staff

1 recommendation because that's where the details are.

2 Q Okay. And I believe there was a place -- not to
3 quibble -- but I believe there was a place specifically in
4 your testimony, on page 9 or 10, where you just simply say
5 that the Commission voted to adopt Staff's final
6 recommendation utilizing the Hatfield method and Staff's
7 input on costs. That's lines 19 through 21, page 10?

8 A (Witness Wood) Yes.

9 Q Okay. Now length of the drop wire, the Hatfield
10 model proposed based on varying density zone drops ranging
11 from 50 to 150 feet; correct?

12 A (Witness Wood) That's correct.

13 Q And the Staff recommended a drop length on a
14 deaverage basis of 177 feet; correct?

15 A (Witness Wood) I think they suggested 177 be used
16 for everything, across the board.

17 Q Well, no, actually I would -- That's my next
18 question, although you may have answered it. I believe the
19 process there -- and perhaps this will refresh your
20 recollection -- was that they took 177 as the average rate
21 and then they deaveraged it by density zone, so that in the
22 most dense area it's 50 feet; in the least dense area it's
23 390 feet. Does that refresh your recollection?

24 A (Witness Wood) I don't recall the specific
25 numbers. It's been a while. If you've got a page

1 reference, I've got the Staff rec right here.

2 Q Okay. And this information that you don't recall
3 specifically would be listed on Exhibit 3 to that
4 recommendation; correct?

5 A (Witness Wood) Well, I guess I'll find out.

6 Q Okay.

7 A I think the answer is yes.

8 (Whereupon, the transcript continues in Volume 16
9 without omission.)

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