BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of	DOCKET NO. 990649-TP
INVESTIGATION INTO PRICING OF UNBUNDLED NETWORK ELEMENTS.	

****
* *
* ELECTRONIC VERSIONS OF THIS TRANSCRIPT *
* ARE A CONVENIENCE COPY ONLY AND ARE NOT *
* THE OFFICIAL TRANSCRIPT OF THE HEARING *
* AND DO NOT INCLUDE PREFILED TESTIMONY. *
* *
****

PHASE TWO

VOLUME 10

Pages 1355 through 1542

PROCEEDINGS:	HEARING
BEFORE:	CHAIRMAN J. TERRY DEASON COMMISSIONER E. LEON JACOBS, JR. COMMISSIONER LILA A. JABER
DATE:	Tuesday, September 19, 2000
TIME:	Commenced at 9:30 a.m.
PLACE:	Betty Easley Conference Center Room 148 4075 Esplanade Way Tallahassee, Florida
REPORTED BY:	JANE FAUROT, RPR FPSC Division of Records & Reporting Chief, Bureau of Reporting (850) 413-6732

APPEARANCES:
(As heretofore noted.)

REPORTER'S NOTE: Page 1356 was reserved in numbering, but not needed. Transcript follows in sequence on Page 1357

I N D E X

WITNESSES:	PAGE
D. DAONNE CALDWELL	
Continued Cross Examination by Mr. Melson	1359
Cross Examination by Ms. Boone	1382
Cross Examination by Mr. Bressman	1393
Redirect Examination by Mr. Ross	1400
JAMES WILLIAM STEGEMAN	
Direct Examination by Mr. Ross	1417
Prefiled Direct Testimony Inserted	1420
Prefiled Revised Direct Testimony Inserted	1487
Prefiled Rebuttal Testimony Inserted	1494
Cross Examination by Mr. Lamoureux	1520

INDEX OF EXHIBITS

NUMBER:		ID.	ADMTD.
105	BellSouth Revised NCR's (2-W UCL Short, 2-W VG Loop)	1362	1416
93-96			1415
104			1416
106	Deposition of McMahon	1416	1416
107	Deposition of Sichter	1416	1416
108	Deposition of Dickerson	1416	1416
109	Deposition of Cox	1416	1416
110	Deposition of Greer	1419	1419
111	JWS-1 through 5 (D) and JWS-1 and JWS-2 (R)	1419	

CERTIFICATE OF REPORTER 1542

P R O C E E D I N G S

(Transcript follows in sequence from Volume 9.)

CHAIRMAN DEASON: Call the hearing back to order. Mr. Melson.

MR. MELSON: Thank you.

D. DAONNE CALDWELL

continues her testimony under oath from Volume 9:

CONTINUED CROSS EXAMINATION

BY MR. MELSON:

Q Could you turn -- Ms. Caldwell, I think we are on Page 11 of Exhibit 104. And I guess I would like you to focus specifically on Lines 14 and 15, not on Line 13 which was related to a late-filed exhibit.

Could you explain to me what work activities are described on Lines 14 and 15?

A Okay. On Lines 14 and 15 under the buried and aerial application, we are talking about the outside plant construction associated with -- what we have listed here is opening and closing the splicing and deloading the ten pairs. The actual details of all the activities involved in that, I will need to defer that to Mr. Greer.

Q Okay. But Line 14 -- if I understand, when you remove load coils from a loop, you open a splice case, you remove the load coils and you reclose the splice case, is that a big picture summary?

A That is a simplistic view of it. I mean, there are lots of details of finding the right cable and the right pairs. But Mr. Greer has all the details.

Q Okay. And on Line 14 you are showing -- if I read this correctly in Column E, 60 minutes or one hour for the process of opening and closing the splice case, is that right?

A Yes, for that item.

Q And you are showing on Line 15, 90 minutes for deloading the ten pairs while the splice case is open, is that correct?

A As this is labeled, yes.

Q And so for that piece of the activity we are talking about a total of two and a half hours?

A For those two items, correct.

Q All right. Now, I gather from your answer to one of my questions just a minute ago, are you the person that is responsible for developing the tasks and the task times that are shown on this worksheet?

A The actual tasks are developed in the cost department as far as just labeling, but they are actually generated through the product team in terms of the activities that were required. What you will sometimes find is from a cost analyst we may have summarized some of the numbers together into one item and had more of a

little simplistic approach on the form, but that is the process.

Q Okay. But if we had any detailed questions about what the tasks actually involved or how the time estimate was developed, those would be questions for other witnesses?

A Mr. Greer will go through the tasks and the appropriateness of the times.

Q All right. I've got one more handout.

Ms. Caldwell, what this sheet is designed to do is to compare some nonrecurring charges for UCL short or unbundled copper loop short with some nonrecurring charges for voice grade loop. If you turn to your Exhibit DDC-7, I believe, that was an attachment to your rebuttal testimony, I think you will see much of the same information on that exhibit.

A Okay. I'm with you.

Q You have had a chance to briefly review the numbers on this document, do they appear to tie back to what you have presented as cost in one or more of your exhibits?

A Yes.

MR. MELSON: All right. Commissioners, I would like to have this marked as Exhibit 105, if I could, please.

CHAIRMAN DEASON: It will be so identified.

(Exhibit Number 105 marked for identification.)

BY MR. MELSON:

Q And I just want to walk very briefly through this to get an understanding of the different cost components here. And under the column labeled two-wire UCL short, the first set of items is called electronic loop makeup without conditioning. And could you tell the Commission what a mechanized LMU represents?

A We discussed earlier what a loop makeup was, and that is what LMU stands for is for loop makeup. And by mechanized this means that the ALEC accesses BellSouth's existing OSS system, it is called an LFACS, and obtains the information from that mechanized system as to the makeup of that particular loop.

Q And in the case of a DSL provider, if that loop makeup information indicated that the loop was suitable for the type of service that the ALEC wanted to provide, the type of DSL service, it could reserve that loop at the time it was doing the mechanized loop makeup inquiry, is that correct?

A Yes, it could.

Q And if it then proceeds to order that loop as a two-wire unbundled copper loop short, there is a nonrecurring cost of $199.01, is that correct?

A Yes.

Q And then there is what is called a ULM additive of $57.99. Is it fair to say that ULM additive is the cost of removing load coils and bridged tap from other loops, loops other than the one being ordered?

A Not entirely. I mean, I think that is a general term. Let me explain what it is. First of all, it is only associated with load coil removal. And what we have done in the study is we assumed that when we are working with a loop that is short, its maximum length is 18,000 feet from the CO, that when BellSouth goes in to actually remove a load coil it will deload on an average ten pairs at a time.

So if you look at that, that cost is somewhere -- the whole activity cost is going to be much closer to over $700 to do all of that. And, again, I'm rounding up and I'm using the costs associated with the long as a representative there. But it is the total cost of doing the activity for ten. But when we calculate the actual cost for the load coil removal on a per pair basis we divide by ten.

And what is assumed is that out of those ten pairs that we condition, two of them on an average will be ordered by the ALEC at the initial time-of-use, four of them will be used by BellSouth, and then four of them will

be either non-used or used by a CLEC at some future time. So what the additive -- all it does is it looks at the cost of that four for us to recover the cost of that four, and we include that as an additive to the nonrecurring for any CLEC that could benefit from that. So it is within the 18,000 kilofeet only on the xDSL loops, and that is what it represents.

Q So let me try to summarize that. You assume that you -- when you actually deload a loop or deload loops you deload ten pairs at a time, you assume that four of those ten loops may, the cost of doing that may go unrecovered, and therefore you spread that cost back over ADSL, HDSL, short UCLs?

A Yes, over the short loops.

Q And the level of that charge is influenced, is it not, by the number of or the percentage of loops in BellSouth's network that you assume will require conditioning, that is one of the inputs?

A It is the number of -- excuse me, it is the number of loops out of what the ALECs order that would need conditioning, correct.

Q All right. And so to the extent -- if the number of loops that actual -- that ALECs order that actually needed conditioning was, say, half of what you have projected, this additive would be roughly 50 percent

lower?

A I don't know if it would be roughly 50 percent. I would have to think about how the demand numbers are calculated. But the percent of the demand numbers, the demand for ALEC xDSL loops and the percentage of those that require load coil removal does impact the number, I will say it that way.

Q Okay. So either an overestimate in the percentage of loops that need to be deloaded or an underestimate in the demand for DSL loops would have the effect of increasing this additive?

A I'm sorry, I lost you.

Q Okay. If a smaller percentage of loops required conditioning, this additive would be lower?

A Yes.

Q If there was greater demand for DSL loops than what you have projected, this number would also be lower?

A Yes. Those two items do impact the numbers.

Q All right.

A But Mr. Latham is here to discuss the numbers and the accuracy of those numbers and why we feel they are appropriate.

Q So you just took the numbers that he gave you and plugged them into the formula that creates this additive charge?

A Yes. He provided those particular inputs.

Q And so if I did -- if I was an ALEC ordering a two-wire UCL short, I have done an electronic loop makeup, I have reserved the loop, I have ordered it, I am going to pay a total up-front charge of $257.69, is that right?

A Correct.

Q Okay. Now, let's assume that I start with the mechanized loop makeup inquiry trying to find out the makeup of a loop that I may want to buy, and for some reason I don't get enough information out of the electronic system. And that can happen, can it not?

A I believe it can.

Q Okay. In that case, if I wanted to pursue it and find out the loop makeup, I would have to request a manual loop makeup, is that right?

A Yes.

Q And that involves, essentially, BellSouth personnel using a system known as Mapviewer to view essentially an electronic drawing of the loop, a plat, and taking the loop makeup information off of that plat, is that a fair summary?

A I can't answer that in terms of the Mapviewer. I will have to refer that one to Mr. Pate. But in terms of the activity, we do look at the plats. I just do not know if in Florida it can always be done through

Mapviewer. But it is that function to look at the location records to get the makeup.

Q Okay. And the difference between the NRC in the first situation and the loop NRC with the manual loop makeup, the difference between $199 and 331 is the cost of doing that manual activity?

A That is predominantly the cost. It goes through the service representative at the LCSC that also takes the order. That is included in there. But it is predominately the cost of physically going in and have a human being look at that location record and determine the makeup of the loop.

Q Okay. Now, if that loop makeup information comes back and says there are load coils on the line and there is some bridged tap that is more than the ALEC's service can tolerate and the ALEC orders both -- orders the loops and asks that the load coils be removed and the bridged tap be removed, it would pay separate charges for load coil removal and the bridged tap removal?

A Yes, they are calculated separately.

Q Okay. And it would also pay the ULM additive, which is designed to recover the cost of removing load coils from other loops?

A Yes. From those four that I discussed earlier.

COMMISSIONER JACOBS: On the additive, as I

understand it each CLEC that orders the loop pays this condition -- this additive, I'm sorry?

THE WITNESS: Yes.

COMMISSIONER JACOBS: So I assume you have done some calculation that figures out that you will only recover that four, the cost for the four that you would not have recovered?

THE WITNESS: Yes, I have.

COMMISSIONER JACOBS: Okay. How does that work?

THE WITNESS: Basically, what I did to determine that I am only recovering the cost of those four, is I looked at my demand for all ALEC loops, then I looked at the costs that it would take to go and unload the ten. And then I basically took 40 percent of that cost and spread it over the demand in simple terms.

COMMISSIONER JACOBS: And then that assumption then gets mapped against some demand that you actually incur? Because as I understand your answer a few moments ago, if demand goes up that is going to lower the amount of the unrecovered. The amount that you don't recover is going to go down if the demand goes up.

THE WITNESS: Your last statement is correct. What I have actually done is we have demand that we have -- actually what we had to do in 1999 as a guide and then we have three years worth of projected demand because

I need to look out into the future.

COMMISSIONER JACOBS: Okay. Thank you.

BY MR. MELSON:

Q And would you -- and the demand that is used to drive this 40 percent that may otherwise go unrecovered, those are loops that are going to be deloaded and would be available for ordering by another ALEC, or would be available for BellSouth's use in its provision of its own ADSL service, is that correct?

A This four would be for ALECs. We have already taken into consideration in our number that BellSouth will be using four for their own.

Q And if BellSouth happened to need six for its own use rather than four, there is nothing that would prohibit it from using two of these loops, is that correct?

A That could always happen. But, again, you are looking at the average of deloading ten pairs and then you are looking at the average numbers that the ALECs would use and BellSouth would use.

Q And that is all based on your forecasts?

A Correct.

Q Okay. If I were ordering a two-wire voice grade loop, there is essentially a single nonrecurring charge of $83.20, is that correct?

A For the service level one, the nondesigned loop, correct.

Q All right. And it is not on this chart, but assume that two years later -- assume that I have ordered one of these loops and that two years later my customer cancels the order. Do I pay a disconnect charge at that time?

A I do believe we have calculated disconnect charges for the actual loop itself.

Q All right. And could you turn to those, and I believe you are going to find them on Exhibit DDC-6 to your revised direct testimony. And I guess I would refer you first to Page 15 of that Exhibit A.13.9. Are you with me?

A Yes, I found it.

Q Okay. And the disconnect charge, if I had originally ordered the loop without loop makeup information, would be $108.29, is that correct?

A Correct.

Q And if I had originally ordered the loop with the manual loop makeup information, the disconnect charge would be $154, is that correct?

A Correct.

Q Why does it cost more to disconnect a loop based on whether or not two years ago I had ordered manual loop

makeup or electronic loop makeup?

A To answer that in detail I would have to pull the workpapers. In general, as I remember, it has to do with the way the order actually flows through the system, through the service rep when they take the individual order. When you are looking at the disconnect, if you ordered it without loop makeup, we are assuming that you are a mechanized ALEC. So, therefore, you will be doing your ordering and your disconnecting through your mechanized system.

If you ordered it with loop makeup, then in most cases it is assumed that you would be a manual operating ALEC. So I believe that is going to be the difference, in the time to handle the order.

Q But would you agree with me that an ALEC that ordinarily orders electronic loop makeup and places its orders electronically may have to order manual loop makeup on a given loop because your system doesn't contain -- your electronic system doesn't contain adequate information?

A Yes, that is a possibility.

Q All right. And the disconnect charge on the SL-1 voice grade loop, I think, appears on a different page, but I read it as $55.97. I believe that is on Page 13 of 21.

A Yes.

Q Would you agree that the differences between a UCL short, which is an unbundled copper loop short, and an SL-1 voice grade loop, that the primary differences are the UCL short has a test point, you provide the ALEC with a design layout record, or a DLR, and there is some cost involved for order coordination?

A From the SL-1?

Q Yes.

A Okay. The SL-1 -- let me just go through these to be sure we are together. The SL-1 is like the basic 1-FR/1-FB type offering that you have. It is a nondesigned circuit. It works off the basic network you have out there today, so there is no test point. It is the cheapest loop that you can offer. There is nothing unique about it. So it has no requirement for a loop makeup. It can work on both copper and digital loop carrier.

If you look at any of the xDSL loops, they are designed circuits. They have circuit equipment placed on them, they have to meet certain parameters, so therefore there is testing required for those loops. And they actually, in this particular case, are associated with the copper offering. And I think I mentioned that they have the test point on them. And I believe that is the major

differences.

Q All right. To the extent that a DSL provider doesn't want a test point, doesn't want a design layout record because they have done an electronic loop makeup inquiry and determined for themselves what the makeup of the loop is, and doesn't want order coordination, there essentially at that point is no difference between the UCL short and the voice grade loop, would you agree with that?

A No, I don't agree with that, because it's how you are going to use it. And I can refer to other witnesses that can add more from a technical standpoint, but if you want an SL-1, you get nothing but a voice grade loop, no guarantee that it will be on copper, no guarantee it will be on DLC. There is no guarantee that if you put it on copper today it won't be DLC tomorrow when we modernize the network. And there is no special parameter requirements that we have for that loop. It is just an SL-1. And you order an SL-1, you get an SL-1.

For the xDSL offerings, we have parameters defined, we give you what you -- I mean, we provide what is specified in each one of these individual loops. And there are differences.

Q Okay. If I want an unbundled copper loop short and I have done as the ALEC, the loop -- electronic loop makeup, and I have said I want this particular loop,

then -- and that loop is going to be capable of providing voice grade service?

A And SL-1 will provide voice grade service, correct.

Q And any loop I identify by going through your electronic loop makeup process is going to be capable of providing voice grade service?

A Yes.

Q All right. If I found the loop I want and I don't want a test point, and I don't want a design layout record, and I don't want order coordination, can I simply order that as an SL-1 loop?

A You can order an SL-1 loop. But there is no guarantee that when you put your equipment on it it is going to work. What you get is an SL-1 loop. That's all I'm saying. That is what is in the cost study is for an SL-1 loop, and you can order an SL-1 loop and use it as we have costed it and defined it.

Q And one thing you mentioned in response to an earlier answer was with an SL-1 loop I don't have any assurance that the loop won't be -- if it is copper today, it won't be changed out to a DLC system tomorrow, is that correct?

A That is correct.

Q What is it about a UCL that tells BellSouth if

we come out and upgrade our plant that we are not going to roll this particular loop from copper to DLC?

A It is identified in our records as an unbundled copper loop.

Q So it is essentially the fact that it has got a particular USOC code or some sort of identifier attached to it?

A It has got an identifier, I don't know if it is just the USOC, but it is identified in our records.

Q All right. Is there any reason that an SL-1 loop -- that you could not designate an SL-1 loop as a loop that was not to be rolled over?

A That is not in my cost. That requires additional nonrecurring times to do that type activity, it require tracking times, and that is not what I have included in the cost for an SL-1.

Q Doesn't every loop have a loop identifier?

A Some type of ID, correct.

Q Okay. So the question is assigning one type of ID to the loop or assigning a different type of ID to the loop?

A I don't think it is quite that simple. Because when I designed the SL-1 loop, I'm not talking about just identifying it in my records. I have built in my cost study a voice grade network. I have assumed that every

loop beyond 12,000 kilofeet is on digital loop carrier. If that is the case, then your SL-1 to work on copper has got to be less than 12,000 kilofeet. There are underlying assumptions in that SL-1 recurring cost study that makes it different. That is why we have different cost studies.

Q I guess that didn't answer my question. If every loop has some identifier associated with it, is there an incremental cost associated with putting an identifier that says don't roll this loop, versus an identifier that does not contain that type of restriction?

A In terms of just maybe an identifier, we would have to set up the methods and procedures to do that.

Q And, in fact, you developed a method and procedure for UDC which says this particular type of ISDN loop that is being ordered to provided IDSL service has got some restrictions on what channel it can use, and so we have to develop methods and procedures to identify that loop so that it doesn't get placed in the wrong time slot on a DLC, is that correct?

A Yes. We handle that in the separate element.

Q Okay. And there is no separate charge, there is no incremental charge for using a different method and procedure for a loop that is going to be used for IDSL than providing an ordinary ISDN loop?

A Not for just that particular activity. But what

I keep coming back to is, though, the loop we are talking about right there works physically, technically just like the ISDN. So when I studied the ISDN, I got the cost, the correct cost for this new loop I'm talking about.

When I study an SL-1, there are underlying assumptions in that cost study that make it different than what I studied associated with the xDSL offerings, which are 100 percent copper based.

Q Let me ask you now just a few miscellaneous questions about your prefiled testimony and then I think I will be finished. At one point in your rebuttal testimony, and I asked you about this during your deposition, you state that Mr. Riolo in some of his testimony was relying on an outdated document.

Do you recall that statement in your testimony?

A Talking about the LCSC work time?

Q On Page 14 of your rebuttal at Line 17.

A Where was that again, I'm sorry?

Q I believe it was Page 14 of your rebuttal testimony at Line 17.

A I'm sorry, I misunderstood. Okay, I'm with you.

Q And would you agree with me that under the Commission's order in this docket, BellSouth was required to provide all necessary workpapers to the parties to enable them to understand your cost studies?

A Yes, we provided the cost study workpapers.

Q Okay. And here you are criticizing Mr. Riolo for relying on an outdated document. Would you agree with me that that is with one of the documents BellSouth furnished to Rhythms pursuant to a discovery request?

A Yes. We furnished that one to Rhythms as pursuant to discovery requests because the request was for every document that you have in your possession. So that was in our possession and we provided that.

Q Did you provide any more updated version of that document that included more recent information?

A I believe I stated in my testimony that we did not have a written document that had an updated number, that we obtained that number verbally from the subject matter expert to change it.

Q All right. At Page 27 of your rebuttal, Lines 20 through 25, you have divided the universe of unbundled copper loops into UCL shorts and UCL longs with a break point of 18,000 feet, is that correct?

A Correct.

Q And the result -- how does the monthly recurring rate for a UCL long compare to the monthly recurring rate for a UCL short?

A Well, basically what I have in my testimony, if you are looking at the two-wire unbundled cooper loop

short, it is $18, a little over $18. And if you are looking at the two-wire unbundled long, it is about $53. Because the average loop length when you put no limitation at all on the copper length, it is almost four times as great.

Q And would you agree with me that there are no ALECs today that are ordering loops for ADSL service that would have an average length of 42,000 feet?

A Not that I am aware of. But we were requested to provide a loop of unlimited length. And so if you put no length limitations on it, basically this becomes the average loop length of every possible location within BellSouth.

Q And it was BellSouth that developed the UCL short offering and the UCL long offering and decided where to put the break point between those two offerings, or whether to create two offerings rather than three or rather than four?

A In terms of the exact break point in the two offerings, I am going to refer that to Mr. Latham.

Q Okay. Could you turn to Page 46 of your rebuttal testimony, and at Lines 14 to 15 you state that BellSouth does not agree with an adjustment that Mr. Darnell has proposed that BellSouth should offset land, building, and power expense accounts with collocation

revenue when developing a loading factor, is that correct?

A Correct.

Q I would like for you to assume hypothetically a central office with 10,000 square feet of space and 1,000 square feet of that is occupied by collocators. The way you have done your cost study, isn't it correct, that the entire cost of the land, building, and power is included in the development of your loading factor?

A If BellSouth owns the building it is.

Q And BellSouth in this hypothetical is receiving some revenues compensation from collocators for the use of 10 percent of that space?

A Yes, in your example.

Q Okay. And if that revenue, collocation revenue were used to offset the carrying cost of the land, building, and power investment, you would agree with me that the factor that you calculate would be somewhat lower?

A It would be somewhat lower. But if you took all the land and building investment we have and then look at what small amount we get from revenues from collocation, you are not going see a shift in that factor. These factors are not that large as they are now.

Q Have you, in fact, looked at the collocation revenue that BellSouth is projected to receive over your

study horizon?

A We haven't looked at the entire projected revenue, but we have done some cursory looks to start to see the size of the accounts and the revenue impact that we could see. So we have started gathering that data. And any indication I have so far is it wouldn't move the factor.

Q I've got one last question. You have mentioned several times during your testimony that the various DSL capable loops are different from the two-wire voice grade loop because of the way the products have been designed, and the way they are offered, and the features they include.

Would you agree with me that one of the issues that has been identified for the Commission to resolve in this proceeding is what is the proper definition of a DSL capable loop for purposes of doing cost and pricing studies?

A Yes, that is one of the issues.

Q And would you also acknowledge that that is an issue on which BellSouth and the data ALECs do not agree?

A I believe based on some of your comments that there are some differences, yes.

MR. MELSON: Thank you.

CROSS EXAMINATION

BY MS. BOONE:

Q Hello, Ms. Caldwell, I'm Cathy Boone with COVAD. I am another DSL provider, as you know.

A Hello.

Q I would like to ask one quick follow-up and then a series of other questions. Can you identify for us in the ISDN cost study an incremental cost for identifying the ISDN loop as an ISDN loop?

A I believe I said there is no difference.

Q Okay. And just to be clear, in the UDC or the IDSL cost study, can you identify for us where there is an incremental cost for labeling it the UDC or IDSL?

A When I answered your first question I thought that was what I was answering.

Q Okay. I was asking about the ISDN loop first and the answer was no, correct?

A I'm sorry, I got lost.

Q Okay. Let me ask it again. That's fine. Can you identify for me where in the BellSouth cost study there is any cost for identifying an ISDN loop as an ISDN loop?

A I will have to look at the study, but I believe there is cost in there associated with identifying it in our records as an ISDN because it has a special plug on it.

Q Okay. And can you identify for me anywhere in the UDC/IDSL study a different cost for labeling that differently?

A No. The UDC and ISDN costs are the same.

Q Okay. I would like to ask some questions about the unbundled loop modification additive as well, but they are different questions than Mr. Melson's.

Do you have a copy of that study up there? I can hand you a copy. It is also attached to Mr. Latham's deposition as Exhibit 1, the entire part is Exhibit 1.

A I have everything except the last page, Page 16.

Q Okay. Because it is the last page that I am going to talk to you about. Do you also have up there, Ms. Caldwell, Exhibit DDC-7, which was part of your filing of August 21st, 2000? It is a chart, I believe, comparing your previous filing with your most recent filing.

A DDC-7. Okay.

COMMISSIONER JABER: What is DDC-7 attached to, Ms. Boone?

MS. BOONE: Her August 21st filing. Is it called rebuttal?

THE WITNESS: It is rebuttal testimony.

MS. BOONE: Thank you. DDC-7.

BY MS. BOONE:

Q I just wanted you to tell us from that exhibit

what is the additive charge that BellSouth is proposing on each DSL loop?

A The additive that we have calculated is $57.99.

Q Okay. Now, this additive will be applied to all ADSL loops that are purchased by ALECs, correct?

A ADSL, HDSL, and unbundled copper loop short, not the long.

Q Okay. This is supposed to enable BellSouth to recover its full cost of conditioning, is that your testimony?

A Yes, for the four pair I mentioned earlier.

Q And the additive is based on the assumption that you are removing ten load coils at the time, correct?

A That you are actually conditioning ten pairs at a time.

Q Okay. If you are basing -- if this assumption were changed -- as you know, the data ALECs have proposed that the average be 50 pairs be conditioned at a time. So if your assumption were based on 50, that would dramatically lower the additive, is that correct, on conditioning 50 pairs at a time?

A Would lower the additive?

Q Uh-huh.

A No. Because it is still going to cost me over $700, now even more because I'm doing a lot more pairs,

but I'm only going to use the original number that I talked about. So instead of having four that I need to recover, I am now going to have, what is that, like 44.

Q Okay. So it would actually increase the additive?

A Yes. Because you have now created more pairs that are not being used.

Q Well, theoretically not being used. In BellSouth's view not being used.

A (Indicating yes.)

Q Okay. Now, if you change the demand assumption, would that also change your administrative?

A Yes, I think I mentioned that the demand does drive the additive.

Q Okay. But you mentioned that Mr. Latham was the person that knew what the demand cost was, the numbers were?

A Yes.

Q And he gave you all of those numbers?

A He provided the demand numbers, right.

Q Okay. Do you know where he got those from?

A No, I do not.

Q Now, if you could just look at Page 16 very quickly. I know you didn't create these numbers, I just wanted to ask you if these are all correct. If you look

at the very last line, Line 46 of Page 16, the total number of loops forecast is 14,211, is that correct?

A For 2001?

Q Correct, for 2001.

A Yes.

Q And subject to check, would you agree with me that that is an increase of 4,741 above the year 2000? Does that look about right?

A Yes, that's about right.

Q Okay. So, we are in September of the year 2000, do you have any idea how many DSL loops are currently in place in Florida?

A No, I do not.

Q Okay. So you don't have any idea if that number 9,470 is correct, do you?

A Again, Mr. Latham provided these numbers and he will have to justify --

Q Okay. And then there is a 4,700 increase proposed for the next year, correct?

A Correct.

Q And then the year following that there is about a 3,554 line increase?

A Correct.

Q Okay. And that is what you are assuming the numbers will be?

A Correct.

Q And that totally drives the additive cost?

A It is one of the cost drivers, correct.

Q And if that assumption were off by 50,000 lines, what would the effect of the additive be?

A It is going to -- excuse me, it will change the additive if you increase the demand that significantly.

Q Change the additive -- if you increase the demand significantly, it will significantly lower the additive?

A As long as you maintain all the other assumptions as the same, the ten pair, et cetera.

Q Fair enough. Have you read anything in the press to indicate that the demand of DSL is actually going down?

A No, I haven't.

Q Have you read anything in the press to understand the actual demand of DSL is going up?

A No, I haven't.

Q You haven't heard anything one way or another about DSL?

A As to whether or not the demand is going up and down, no. I mean, I am aware of what is being offered in some areas, but I can't discuss that one.

Q You don't have any personal knowledge of that?

A No, I do not.

Q You talked -- you testified -- I guess you mentioned that you have testified in Commission hearings here in Florida before, is that correct?

A Yes, I have.

Q In cost cases?

A Yes, I have.

Q And would these also be part of arbitrations?

A Yes.

Q Have you ever testified and done a cost study on an ISDN loop?

A Yes, they would be -- ISDN was in the original arbitrations.

Q Okay. And were T-1 lines also included in those?

A Not T-1 by the definition that you often use. We had a DS-1 offering.

Q Which internally at BellSouth are treated the same, is that correct, DS-1s and T-1s?

A I wouldn't necessarily just say that because a lot of times T-1 carries some connotations with it that it is older technology. So I would just like to refer to it as a DS-1 of the 1.544 circuit. It's just a little bit cleaner.

Q As you understand the provisioning of a DS-1

line, does it require the removal of load coils from that line?

A My understanding is for a DS-1 it will not work on load coils.

Q Okay. So if you were to provision a DS-1 and the line had load coils on it, you would have to remove them, is that correct?

A Correct.

Q And the same is true for an ISDN line, correct?

A I believe so. It has been awhile since I actually looked at that in detail. They make changes in these equipment so they will do things differently, but I believe so.

Q Have you conducted any cost studies on PBX lines?

A Probably not just a PBX by itself. It has been a long time since I have looked at any --

Q But with other things?

A I'm just trying to think. I don't think I have actually ever just done a PBX cost study as a stand-alone.

Q And how about a CENTREX line?

A Yes, I have done CENTREX.

Q Okay. And are you aware that some CENTREX lines require loading?

A Some CENTREX lines require loading?

Q Right.

A It has been awhile since I looked at a CENTREX study. The only thing I remember associated with CENTREX is if it -- sometimes just to meet some of the transmission requirements a load coil will resolve that problem.

Q Now, would you agree with me that ISDN lines, T-1 lines, DS-1 lines require conditioning sometimes?

A Load coil removal?

Q Right.

A Yes.

Q Okay. Now, in any of those cost studies that you have done, have you ever used an additive like you are proposing for the DSL lines?

A No, we only looked at the costs associated with provisioning the circuit.

Q Okay. And in those instances in which a line for an ISDN was actually going to require load coil removal, how was that addressed by BellSouth?

A My understanding is in terms of it was going to -- if things of that type were going to be done in the network, then you would just remove the facility to make it work.

Q Without charging?

A I do not believe it is charged for.

Q Ms. Caldwell, do you know how many analog PBX circuits there are in the BellSouth outside loop plant in Florida?

A I do not.

Q Do you know how many analog CENTREX lines there are in the outside loop plant in Florida?

A I do not.

Q Do you know what percentage of BellSouth loops in Florida are special or designed circuits?

A I do not.

Q Let me go back just a second about when I was asking you about the assumptions of removing only ten load coals at a time. When you answered my question about the effects of conditioning 50 pairs at a time on the unbundled loop additive, did you assume that the total time it takes is five times more than when you remove ten?

A No, I did not.

Q You did not assume that?

A (Indicating no.)

Q Did you assume that the cost decreased?

A To do 50 instead of ten?

Q Uh-huh.

A No. The cost is going to increase because you have got to actually handle 50 pairs instead of ten.

Q So -- okay. And you know for a fact that it

significantly increases the time it takes to remove 50 as opposed to removing ten?

A Well, I know from looking at just my unbundled copper loop long to -- and in looking at it you are looking at somewhere around $700, a little over $700 to do the first pair, and then a little over $20 to do each additional pair. And that is the splicing associated with it, and that is straight from the cost study.

Q Okay. So what you are stating is if you have got the splice open and you remove load coils from ten pairs it takes exactly the same amount of time as if you removed it from 50?

A No, I'm saying if I removed -- if I removed load coils from 50 it is going to take me a lot longer than if I just removed load coils from ten.

Q Okay. How much longer?

A Well, I mean, I can't talk the numbers because I don't have those in front of me as far as the time estimates. But you can look at the cost study for the long as a guide. And the cost study for removing the load coils from the first pair, which is the setup, is a little over $700, and then it is approximately $24 for each additional pair. So multiply 49 times 24 and add that to 700.

Q Okay. And do you have personal knowledge of the

numbers that underlie those?

A I have personal knowledge of these cost numbers. The work times, that is Mr. Greer that develops these numbers. But, yes, I developed these cost numbers.

Q Okay. So your testimony is it is going to take a whole lot longer for 50 than for ten?

A Yes.

MS. BOONE: Thank you.

CROSS EXAMINATION

BY MR. BRESSMAN:

Q Ms. Caldwell, I'm Michael Bressman with BlueStar. I would like to focus mainly on work times for a moment.

A Okay.

Q In establishing your rates you received work time inputs, correct?

A Yes, I did.

Q Do those work time inputs vary by state?

A Normally they are regional work times.

Q In your testimony I believe you stated that your cost support materials include certain -- actually let me rephrase that. Did your cost support materials include certain TOC study results?

A The way that the TOC study that was used in the cost study at all was when we were preparing to do -- and

when I use the term we, I'm talking about all the cost analysts that work in our department -- when we were preparing to do the nonrecurring cost studies, we had some information that was available on some existing TOC studies. And I do believe that the cost analysts took that information and provided it, the summary of that information to some of the subject matter experts who provided the inputs to see if it was still reasonable. The data was quite old.

Q When was that TOC study conducted?

A I believe we actually said in one of the data requests. I hate to guesstimate.

Q Does 1992 sound right?

A I think it was a little before that.

Q Even above that?

A Yes.

Q What does the acronym TOC stand for?

A Task oriented costing.

Q Is it correct that the TOC methodology is one that solicits estimates of task times from subject matter experts and then combines those individual estimates into a single weighted average estimate?

A Yes. It is a much more structured environment than just asking for individual estimates. Because there are certain procedures they go through to be sure that

each subject matter expert understands the question; but, yes.

Q In other words, is a TOC -- is it one that reflects the opinions of the experts surveyed as to the task times that should be used to establish nonrecurring costs?

A I believe that would be correct.

Q Now I want to discuss another term that is sometimes used in talking about task times, and that is a time and motion study. Are you familiar with that term?

A Yes, I am.

Q Would you agree that a time and motion study measures the actual time that it takes a technician to perform a particular task?

A Yes.

Q So it's not exactly the same thing as a TOC study?

A No, it is not.

Q And would it be correct to say that normally a time and motion study would average the results of several individual measurements of a technician performing a given task?

A I'm sorry, you will have to repeat that one.

Q I'm sorry. Would I be correct in saying that normally a time and motion study would average the results

of several individual measurements of a technician performing a given task?

A Usually it depends on your resources. Sometimes time and motion may just use one if that is all that is available. But it could be several technicians then averaged.

Q And would it be correct to say that a time and motion study does not reflect opinions about task times, but instead reflects actual measurements?

A Yes, it is a time measurement.

Q So a TOC study and a time and motion study are two different ways to estimate task times for use in a nonrecurring study?

A Yes.

Q Has BellSouth conducted any time and motion studies?

A The only time and motion I know that was in relation to these studies was I believe on -- and I want to think it was LCSC where they actually did some time and motion type measurements.

Q And how recently was that?

A That was associated with the inputs for this study.

Q Do you have the depositions, the BlueStar depositions in front of you? The BlueStar depositions in

front of you, specifically Exhibit 101?

A No, I do not.

Q Ms. Murphy's. While you are looking, may I ask you, do you know who Nancy Pauline Murphy is?

A I'm not really -- yes, I know who she is in terms of providing inputs to the cost organization.

Q Would it be fair to say that she is the LCSC's SME?

A That is my understanding, correct.

Q Will you turn to Page 19 of her deposition transcript, beginning on Line 2, I asked her the question -- I asked Ms. Murphy the question, "Have you ever heard of a time and motion study? And her answer was yes, I have. And have you performed a time and motion study? And her answer was no, I have not."

She was also asked whether she was -- I also asked her whether she was asked to perform a time and motion study, and her answer was, "No, I have not."

Do you know if someone else at the LCSC performed a time and motion study?

A No. I mean, I will stand corrected if she said she did not. My understanding is that she did do some time watching of her individuals. And if she said no, then I stand corrected.

Q And do you know if any of the other SMEs or any

other groups performed any time and motion studies?

A Not that I am aware of.

Q So primarily the task times are estimates -- how would you best characterize the task times?

A They are estimates of the individuals who either are familiar with the job, or have some type of experience, or individuals that perform the jobs, or knowledge, I guess, is the best way to look at it of the activities.

Q I just wanted to change subjects briefly and discuss the fallout rates for a moment, again.

A Okay.

Q Do you recall what the -- assuming we have done, an ALEC has done an electronic loop makeup inquiry and has ordered the loop electronically, an ADSL loop, an HDSL loop, or a UCL, do you know what the fallout rate was, if there was one, in the cost study for those loops?

A In which element?

Q I'm sorry, the ordering fallout rates. Is there any ordering fallout rate in the cost studies if you electronically order an ADSL loop, or an HDSL, or a UCL?

A There is in rate element N, I believe it is 1.1, I can double-check. But that is the nonrecurring charge associated with processing the order, and that is where you would have any costs associated with the LCSC to

handle a fallout.

Q And is that a designed fallout?

A It is a combination of designed and nondesigned.

Q Meaning designed and some fallouts are error fallouts?

A Correct.

Q And it is your understanding that once the loop makeup process is in place, the electronic loop makeup process is in place, will ADSL loops, HDSL loops, and UCLs be designed to fallout?

A I cannot answer that.

MR. BRESSMAN: That's all the questions I have.

MR. McGLOTHLIN: No questions.

CHAIRMAN DEASON: Other questions? Mr. Fons.

MR. FONS: Sprint has no questions.

CHAIRMAN DEASON: Staff.

MS. KEATING: Staff has no questions.

CHAIRMAN DEASON: Commissioners.

COMMISSIONER JACOBS: One brief one.

If you were adhering to a forward-looking approach to costing, would you want to modify this cost allocation method for conditioning at some point in time? It would occur to me that if you observed that you are consistently not using 40 percent of the pairs that you condition that that may be a cost that you should review

to determine whether or not it is the one you should incur, would you agree?

THE WITNESS: Yes. Yes, sir. We would be open to any suggestion that we review any of these studies. And that one in particular could be one that you would like for us to look at in the future.

COMMISSIONER JACOBS: Okay.

CHAIRMAN DEASON: Redirect.

MR. ROSS: Thank you, Mr. Chairman.

REDIRECT EXAMINATION

BY MR. ROSS:

Q Ms. Caldwell, I do have a few questions, and I'm going to go in reverse order. Ms. Boone asked you about the circumstances under which BellSouth will remove load coils in order to provide CENTREX and T-1 service, do you recall those questions?

A Yes, I remember the discussion on the load coil removal.

Q And if I understood your testimony correctly, in response to Ms. Boone's questions you indicated that BellSouth would remove the load coils to make that particular circuit work, is that correct?

A That is correct.

Q So, in other words, if there was one CENTREX line or one T-1 line, how many load coils -- from how many

lines would BellSouth remove load coils in that circumstance?

A Excuse me, let me clarify that it is not the CENTREX, but the ISDN, because CENTREX we do not remove for. And in terms of that, normally what we would do is we would try to serve them on any pair that is not loaded to begin with, and then we would condition that pair.

Q Would BellSouth condition ten pair at a time in provisioning its ISDN retail service or its T-1 retail service?

A I believe we would not.

Q If BellSouth is not going to be conditioning ten pair for those particular retail services, is there any need for an additive as Ms. Boone questioned you about?

A No, there is not.

Q Mr. Melson asked you about the three different types of runs that BellSouth did with the BSTLM, do you recall that?

A Yes.

Q And you were discussing with him, I believe, the copper-only run that BellSouth used to develop the costs of the xDSL capable loops, do you recall that?

A Yes.

MR. ROSS: Mr. Chairman, may I approach the witness, please?

CHAIRMAN DEASON: Sure.

BY MR. ROSS:

Q Ms. Caldwell, Ms. White is going to be handing you a document which is the stipulation that was entered by the parties in this case on December 7, 1999. Do you see that document?

A Yes, I do.

Q If I could ask you to look at Paragraph 5 of that stipulation, I have highlighted a sentence, I believe, in that paragraph.

A Okay.

Q Could you read that highlighted sentence into the record, please?

A "The parties agree that there should be no length restrictions on loops, including xDSL capable loops that can be ordered from the ILECs regardless of what loop length assumptions are made in the cost studies for such loops."

Q Without using a copper-only run, is there any way for BellSouth to accurately model the cost of a copper loop that is unlimited in length?

A No, there is not. I mean, as I have mentioned in our first scenarios, we assumed that copper is only placed to 12,000 feet from the CO. So the model in the first two scenarios builds in an automatic length

restriction of 12,000 feet. So the only way for me to get a loop longer than that was to make an all-copper run.

Q If you used the combo run, as Mr. Melson suggested in his cross-examination, to determine the cost of a copper loop, would the model limit the length of the copper loop and developing costs?

A Yes, it would. There would be no copper loop longer than 12,000.

Q You were also asked by Mr. Melson about the deployment of DLC cards that could potentially support BellSouth's ADSL service offerings over fiber, do you recall that?

A Yes.

Q And I believe this was also a question that Mr. Lamoureux asked you. In doing a forward-looking cost study, are you looking at technology that is actually available today as opposed to technology that may be available at some point in the future?

A You look at technology available today, currently available technology.

Q If the technology is not available today, but may be available, let's say, in 2001 or 2002, is it proper to base a cost model on that technology?

A Not if you don't have the information associated with that technology. You use what is currently available

to provide your services.

Q Okay. Mr. Melson -- do you have Exhibit 105 in front of you, which I believe is the cost for the two-wire UCL short and two-wire voice grade loop?

A Excuse me, was that the exhibit from Mr. Melson?

Q Yes, that is correct; Exhibit 105.

A Okay.

Q In the column that is marked two-wire voice grade loop, is it also possible that a CLEC may do a manual loop makeup and also ask for removal of bridged tap and load coils from an SL-1 loop?

A Yes, they could do that. There is nothing that restricts that.

Q So it is not necessarily the case that a two-wire voice grade loop would only cost $83.20 if an ALEC wanted to do other things associated with ordering that loop, is that correct?

A Yes. You would have the cost of the manual loop makeup as well as a load coil removal in that example.

Q Mr. Lamoureux asked you about the structural inputs that are part of the BSTLM, do you recall those questions?

A Yes.

Q And I believe you testified that BellSouth used factors as opposed to using the actual methodology that

the model allows for, is that correct?

A Yes, we use factors.

Q What would be involved in developing the information necessary to populate the BSTLM structural inputs?

A Well, you have to look at it in two categories. You have to, first of all, look at the poles and conduit. So you would have to put information in there as to what it would cost for the pole itself, the material price, plus the cost to install it, as well as the spacing and things of that type. You will would you also then for the conduit have to do the same thing. Now, the pole is a little more direct than conduit.

When you get to conduit it becomes quite extensive for what your inputs could be because you are going to have to dig a trench, put the conduit in it, pour concrete back over it, all these activities have to be recognized. And there is a difference in placing conduit in where you have streets and sidewalks versus if you are placing it where you would just have, like, a yard or some type of dirt type environment. So all of those different functions have to be looked at and you have to determine the individual information for each type of scenario that you would have to put into the model.

Q Does BellSouth have that type of information

readily available that it could use to populate the BSTLM?

A No. We would have to do quite extensive work with our network department to gather that data.

Q You were asked a question by Commissioner Jaber, and I wanted to make sure I understood your answer. I believe you were discussing with the Commissioner the fact that the BSTLM uses more DLC and disregards existing cable routes in designing the forward-looking network. Do you recall the question?

A Yes.

Q And I want to make sure I understood. If BellSouth were to use less DLC and use the existing cable routes, would that result in higher or lower costs than the results generated by the BSTLM?

A If you were going to place more copper forward-looking than is in the DLC that is in the BSTLM, you would get a higher cost.

Q Mr. Lamoureux showed you a copy of the decision by the Alabama Public Service Commission in a geographic deaveraging case. Do you have that in front of you?

A Yes, I do.

Q And just so the record is clear, could I ask you to look at Page 13 of that order at the first ordering clause.

A Excuse me, I seem to have the Florida.

Q I think it is all the way on the right-hand side of your --

A Okay. I'm sorry.

Q That's okay. Page 13, the first ordering clause, at the bottom of the page.

A I'm with you.

Q In this ordering clause did the Alabama Commission give any indication as to whether it was adopting wire center deaveraging on an interim or permanent basis?

A It says on a interim basis. The sentence is, "It is therefore ordered by the Commission that the wire center zone assignments reflected in Attachments 1 and 2 for BellSouth and GTE respectively are hereby adopted on an interim basis."

Q By the way also, how many zones did the Alabama Commission use to deaverage?

A Three.

Q You were also asked by Mr. Lamoureux about the assumptions concerning integrated digital loop carrier technology in the combo run. Do you recall those questions?

A Yes.

Q And I believe you indicated that in looking at the costs of an unbundled loop you did not use IDLC in

calculating those costs, is that correct?

A For the unbundled loop when it is not part of a combo, correct.

Q And I believe you testified in response to Mr. Lamoureux's questions that it is possible to have some kind of work-arounds to take advantage of or to unbundle an IDLC delivered loop, do you recall that question?

A Yes.

Q I'm going ask Ms. White to show you the FCC's Third Report and Order dated November 5, 1999.

COMMISSIONER JABER: Mr. Ross, before you leave the Alabama order, I just noticed something, Ms. Caldwell. It says that -- in the ordering paragraph it also states that the Alabama Commission recognized that there would be factors impacting the zone assignments of wire centers and that is why, in fact, this decision by Alabama was interim.

What factors are impacted by the FCC? Are you familiar with what the Alabama Commission is talking about right there?

THE WITNESS: I'm sorry, Commissioner, I'm not going to be able to answer that.

COMMISSIONER JABER: Thank you. Do you know who would be able to?

MS. CALDWELL: I would have said Mr. Varner, but

he was stipulated. I'm sorry.

COMMISSIONER JABER: Thank you.

BY MR. ROSS:

Q Ms. Caldwell, do you have the FCC's Third Report and Order in front of you?

A Yes, I do.

Q If I could direct your attention to Paragraph 217 of the FCC's Third Report and Order which appears on Page 99 and 100 of the FCC's order.

A Okay.

Q And here in Paragraph 217, the FCC is discussing the need to unbundle subloops because of the fact that the customers are served by IDLC. Do you see that?

A Yes, I do.

Q And the FCC describes the fact that IDLC technology involves the multiplexing of traffic at a remote concentration point and then directly delivering that combined traffic to a switch without separating the traffic from the individual lines. Do you see that?

A Yes, I do.

Q Does the FCC indicate whether the IDLC has any effect on competitors' ability to access IDLC loops at the incumbent's central office?

A The statement is that in such cases competitors generally cannot access IDLC loops at the incumbent's

central office.

Q If you will look at Footnote 417 on Page 100, it cites comments by MCI WorldCom about unbundling digital loop carrier systems. Do you see that?

A Yes, I do.

Q And it identifies four different methodologies proposed by MCI WorldCom to unbundle IDLC delivered loops. Do you see that?

A Yes, I do.

Q If you will look at Number 3, there is a discussion of digital cross-connect systems, which I believe you discussed with Mr. Lamoureux. Do you remember those questions?

A Yes.

Q What does the FCC have to say about the use of digital cross-connect systems as a methodology for unbundling IDLC delivered loops?

A I will start with the quote that it has here, "That the digital cross-connect systems require all loop signals, including signals for loops retained by the incumbent LEC, to pass through the DCS system for processing and is therefore very expensive."

Q Do your cost studies include any costs associated with a digital cross-connect system that would be required in order to unbundle an IDLC delivered loop in

the method suggested by Mr. Lamoureux?

A No, I do not have those costs in the study.

Q Are the costs of any of the methods discussed by the FCC in Footnote 417 of its Third Report and Order reflected in the cost studies that BellSouth has submitted in this proceeding?

A No, they are not.

Q Looking down to Footnote 418, and I am just going to read it. It is on the fourth line from the bottom of that footnote, it says, "In the three years since the local competition First Report and Order, however, such methods have not proven practicable. Competitors are not yet able economically to separate an access IDLC customer's traffic on the wire center side of the IDLC multiplexing devices." Do you see that?

A Excuse me, which paragraph?

Q I'm sorry, it's Footnote 418, the very bottom of the footnote.

A Okay. I'm with you.

Q Is BellSouth's cost study and the run that it did to study the cost of unbundled loops consistent with the FCC's conclusions that the methods for unbundling IDLC delivered loops are not practicable?

A Yes, we are consistent.

Q Finally, just a series of questions that you

were asked by Mr. Lamoureux about the use of in-plant factors and inflationary factors that BellSouth has used in its cost studies in this proceeding.

Has BellSouth used and has this Commission adopted the use of in-plant factors and inflationary factors in establishing the costs for unbundled network elements?

A Yes. When I filed the cost studies in the arbitration, those cost studies did include inflation factors for our three-year time period and they also included in-plant factors.

Q And that would be the arbitration proceedings that were conducted in 1996 and in 1998?

A Yes.

Q You mentioned in response to Mr. Lamoureux about the use of in-plant factors the possibility of creating distortions with respect to the costs of larger cable size. What specifically did you mean by that?

A What you are really looking at is an averaging process, so on the average when you are placing your cable you are going to get all of your money identified appropriately.

What happens in any averaging process when you have a very, very large cable and a very, very small cable, you see differences in those numbers just caused by

the averaging process. However, in this particular case I think we have minimized those effects specifically because when I look at what the model is placing in terms of the size cables, I think I mentioned in my summary it is mainly 25 and 50-pair cables, when I look at our in-plant development, our in-plant development for that same time period was based predominantly on 25-pair cables. So any type of -- result of this averaging I believe is going to be insignificant in these studies that we are looking at here today.

Q Finally, Ms. Caldwell, do you have the Commission's January 7, 1999 order in Docket Number 980696 in front of you? I believe that was -- Mr. Lamoureux questioned you about that order.

A Yes.

Q Could you flip towards the end of the ordering clause. I think I had it tagged for you, but apparently not. Would you agree, subject to check, that the Florida Commission ordered BellSouth to file revised cost studies consistent with its input decision by January 12th, 1999?

A Yes, they did.

MR. ROSS: Mr. Chairman, Ms. White is going to hand Ms. Caldwell a document which I would like to have identified for the record and introduced into evidence. I don't have enough copies for all the parties, but I will

do that this evening, make copies and give everybody one.
BY MR. ROSS:
Q Ms. Caldwell, I have handed you a document which I will represent to you is a letter from BellSouth dated January 13, 1999 in the universal service docket, which is attached as a summary page of the cost results using the BCPM model with the Commission ordered adjustments. Do you see that?
A Yes, I do.
Q Looking at the summary sheet that is toward the end of the page, do you see the investments that resulted from using BCPM with the Commission ordered adjustments?
A Yes, I do.
Q What were the investments, just looking at the loop, using BCPM with the Commission ordered inputs?
A The uncapped investment was $936, the capped investment was 892.
Q And that is on an annual basis?
A That is the investment that then becomes the annually cost that we calculate.
Q And how does either the $892 annual investment or the $936 annual investment compare to the investment using BSTLM and the loadings that BellSouth has used in its model?
A It is really close. If you look at the SL-1

loop, which would be the equivalent loop here, the investment that supports our rate is $852.

Q So is it fair to say that using the BSTLM with the in-plant factors that BellSouth has used it actually results in less investment than using the BCPM and the Commission-ordered company-specific adjustments?

A That is correct.

MR. ROSS: Mr. Chairman, we would like to have that marked as the next exhibit, which I believe will be Exhibit 106.

CHAIRMAN DEASON: We will mark it when you have copies. Just remind me and we will take care of it at that time.

MR. ROSS: Okay. And I have no further questions for the witness.

CHAIRMAN DEASON: Exhibits that have been already identified to be moved?

MR. ROSS: BellSouth would move Exhibits 93 through 96 into evidence.

CHAIRMAN DEASON: Without objection? Hearing none, show that Exhibits 93 through 96 are admitted.

(Exhibit Number 93 through 96 admitted into the record.)

MR. MELSON: And I would move Exhibits 104 and 105.

CHAIRMAN DEASON: objection? Hearing none, Exhibits 104 and 105 are admitted.

(Exhibit Number 104 and 105 admitted into the record.)

CHAIRMAN DEASON: I have been handed a list of BellSouth proposed stipulated exhibits. There is four items on that list. These items will be identified as Exhibits 106 through 109, and without objection these exhibits will be admitted, also. Hearing no objection, show then that Exhibits 106 through 109 are admitted.

(Exhibit Number 106 through 109 marked for identification and received into the record.)

CHAIRMAN DEASON: Thank you, Ms. Caldwell.

THE WITNESS: Thank you.

CHAIRMAN DEASON: We will take a ten-minute recess and then we will take the next witness.

(Brief recess.)

CHAIRMAN DEASON: Call the hearing back to order. BellSouth, you may call your next witness.

MS. WHITE: BellSouth calls Mr. Stegeman.

JAMES WILLIAM STEGEMAN

was called as a witness on behalf of BellSouth Telecommunications, Inc., and, having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. ROSS:

Q Could you state your full name and business address for the record, please.

A My name is James William Stegeman. My business address is 6261 Ashbourne Place, Cincinnati, Ohio 45233.

Q By whom are you employed, Mr. Stegeman?

A I am employed by CostQuest Associates.

Q Mr. Stegeman, did you cause to be filed in this case direct testimony dated May 1, 2000, consisting of 67 pages?

A Yes.

Q Do you have any changes or corrections to that testimony?

A No.

Q Were there also three exhibits attached to that direct testimony? I believe you may have included one exhibit twice.

A I think there are four exhibits.

Q Four exhibits, one of which also appears in your rebuttal testimony, is that correct?

A No.

Q Okay. Four exhibits. You also caused to be filed in this case revised direct testimony dated August 18th, 2000, consisting of seven pages?

A Yes.

Q And you also filed rebuttal testimony dated August 21, 2000, consisting of 20 pages, is that correct?

A Yes.

Q Do you have any corrections to either your revised direct or your rebuttal testimony?

A No.

Q There were also, I believe, two exhibits attached to your rebuttal testimony, is that correct?

A Yes.

Q If I were to ask the questions that appear in your prefiled testimony today, would your answers be the same from the stand?

A Yes.

MR. ROSS: Mr. Chairman, we would ask that Mr. Stegeman's prefiled direct, revised direct, and rebuttal testimony be introduced into the record and that his exhibits that were attached to his direct testimony and his rebuttal testimony be marked as Exhibit 110.

CHAIRMAN DEASON: First of all, without objection the prefiled testimony will be inserted into the record.

Before we identify the exhibit, I just need to take care of a housecleaning matter. BlueStar gave me hopefully the last stipulated exhibit, which is the deposition of Greer. That is going to be identified as

Exhibit 110, and without objection that exhibit will be admitted.

(Exhibit Number 110 marked for identification and admitted into the record.)

CHAIRMAN DEASON: And we will identify the prefiled exhibits accompanying the testimony of Mr. Stegeman as Exhibit 111.

MR. ROSS: Thank you, Mr. Chairman.

(Exhibit Number 111 marked for identification.).

DIRECT TESTIMONY OF MR. JAMES W. STEGEMAN

ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 990649-TP

MAY 1, 2000

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS AFFILIATION.

A. My name is James W. Stegeman. I am the President of CostQuest Associates, Inc. I am testifying on behalf of BellSouth Telecommunications ("BellSouth", "BST" or the "Company").

Q. WHAT EXPERIENCE AND QUALIFICATIONS DO YOU HAVE PERTAINING TO YOUR TESTIMONY?

A. I have a Bachelors degree in Mathematics and Statistics and a Masters degree in Statistics from Miami University, Oxford, Ohio. Previously I was employed with Merrell Dow Research Institute, Cincinnati Bell Telephone, and INDETEC International. My work has included statistical evaluation of data, training, cost estimation, and financial analysis. I have developed systems and models to perform a variety of functions

including the following: cost estimation; competitive assessment; product profitability; and budgeting.

Q. DO YOU HAVE EXPERIENCE WITH MODELS DESIGNED TO ESTIMATE THE COSTS OF BASIC LOCAL EXCHANGE SERVICE AND ITS COMPONENTS?

A. Yes. I designed, coded and implemented the Cost Proxy Model (CPM) currently in use in California. I assisted in the design, coding and implementation of the Benchmark Cost Proxy Model (BCPM). I designed the Universal Service Cost model adopted for use in Hong Kong. I led the development of the Australian Universal Service Cost model, and consulted on the development of similar costing models in Japan. I have also reviewed the HAI and HCPM models during their development.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I describe the BellSouth Telecommunication Loop Model (BSTLM©). This includes an overview of the model development, the process by which customer locations are determined and located, the preprocessing steps, the architecture, logic, and processing of the model, and the models reporting capability. Daonne Caldwell will discuss the inputs into the model and results of the model. Keith Milner will cover some of the engineering aspects of the model.

Also, for the readers' convenience, I have provided a list of acronyms used as an attachment to my testimony as exhibit JWS-1.

Q. BRIEFLY OUTLINE YOUR TESTIMONY?

A. The major sections of my testimony discuss the following topics:

1. BSTLM© background, including a discussion of why the model was built and the nature of its development.
2. An overview of the model architecture, various processing steps, and a description of some of the advantages of the BSTLM©.
3. A discussion of customer data, plant data, geocoding results, and the geocoding process.
4. Geographic Information Systems (GIS) preprocessing of the geographic data used in the model.
5. The GIS Process that determines clusters and the network layout.
6. Configuration component of the model.
7. Investment component of the model.
8. Summary component of the model.
9. Reports generated by the model.
10. The major design points of the BSTLM© compared to other models.

SECTION 1

BACKGROUND

Q. WHY WAS THE BSTLM© BUILT?

A. As BellSouth began planning for the next round of UNE hearings over one and one-half years ago, it was recognized that new loop costs would be needed. Three basic options existed for BellSouth: 1) use the same sampling process used in prior proceedings; 2) expand or enhance existing proxy models in the public arena; or 3) develop a new model that incorporated the best techniques from all models. The third approach was selected. The reasons for this decision will be covered in detail in this testimony.

Q. WHY WAS THE SAMPLING APPROACH NOT USED?

A. While cost studies based upon sampling have been accepted in Florida before, BellSouth recognized that this approach had certain limitations:

- Sampling is very time-consuming and expensive;
- Sampled data becomes dated rapidly;
- Sample data does not provide data for the latest technologies and services;
- Samples typically were only provided at a statewide level -geographic de-averaging is not possible without a significant increase in the sample size;
- Due to the sample, some network elements may not be represented;
- Selection of sample can be contested;

Due to these limitations, BellSouth elected not to pursue sampling in developing its cost studies

Q. DID BELLSOUTH CONSIDER THE USE OR MODIFICATION OF EXISTING LOOP MODELS?

A. Yes. BellSouth was well aware of the models that were available at the time. I also provided assistance in the review of the features of the HAI, BCPM, and the HCPM portion of the Synthesis model. Please note that at the time BSTLM© development began, the HCPM was still under construction.

Q. IS THE USE OR MODIFICATION OF ONE OF THE EXISTING PROXY MODELS A VIABLE ALTERNATIVE?

A. No. The HAI, BCPM and HCPM have been accepted as models for estimating the cost of the efficient carrier providing universal service. In fact, BellSouth was one of the sponsors of the BCPM. However, the existing models have limitations and major modifications would be needed to make the models both applicable for UNEs and to meet the internal demands of BellSouth. The following highlights some of the limitations and required modifications:

- The Proxy models provide results only for basic residential and basic business services.

- The Proxy models would require revisions to provide investments for all services and unbundled network elements (UNEs).
- The Proxy models do not reflect the engineering practices of any specific provider, most importantly BellSouth's engineering practices.
- Model changes may be so significant that the resulting model would bear little resemblance to the original model, thereby, eliminating any benefit of using the platform as a starting point.
- The current platforms of these models do not have the flexibility to meet BellSouth's requirements:
  - Include as much actual data as possible;
  - Account for various network architectures;
  - Model loops associated with all services and UNEs;
  - Provide dynamic reporting;
  - Provide accurate costs at a low geographic level;
- The accuracy of the resulting model may be endangered by the constraints of the selected base platform.
- The cost and time to modify the existing models may be higher and longer than starting from scratch.

Q. WERE THE EXISTING PROXY MODELS IGNORED DURING THE DEVELOPMENT OF BSTLM©?

A. No. To the contrary, the BSTLM© development team was well versed in the methodologies used by the existing proxy models. In fact, members of the development team were instrumental in the development of the BCPM and HCPM and in the review of the HAI. Given this in-depth knowledge, the team was also aware of the design shortcomings of the proxy models.

In building the BSTLM©, the development team incorporated the best methods and techniques of the existing models while incorporating next-generation modeling techniques. The resulting model is truly the "next generation" loop model. The team worked to ensure the BSTLM© would have the following characteristics.

- The results accurately reflect BellSouth's engineering practices;
- It incorporates all of BellSouth's geocoded customer and network data;
- It provides results for most required services and UNEs;
- It does not rely on sampling techniques;
- The results can support geographic de-averaging of costs;
- Would provide an easy-to-use interface.

Q. YOU MENTIONED EARLIER THAT THE PROXY MODELS COULD NOT MEET THE DEMANDS OF THE DEVELOPMENT TEAM. WHAT WERE SOME OF THOSE MODELING DEMANDS?

A. The key design characteristics required in the model were as follows:

- The model must improve upon the routing techniques used in the current models. Use road data to provide a more accurate portrayal of cable routing.
- All loop services and UNEs must be incorporated into the model. In so doing, the model must account for the specific engineering constraints of these services and the dispersion of these services.
- It must incorporate BellSouth's geocoded data, including:
  - All customer points
  - Wire center locations
  - Wire center boundaries
- It must correctly model the provisioning of Special Services. This would include 2-wire, 4-wire and, DS1 loops and subloops.
- The user must be able to control and evaluate all inputs.
- The model must be easy to run, have basic window features, built using common programming tools, open to review, and flexible to meet the demanding and diverse needs.
- The model must reflect the diversity of services and UNEs offered by BST. It must not assume "a loop is a loop."
- It must incorporate BellSouth's engineering approaches.
- The model should perform most processing in the platform to avoid the "Data Black boxes" found in other models. This means that clustering should be a basic part of the model.
- It should use the best modeling approaches to all parts of the network.

- The model should build the network to customers, rather than moving customers to the network that is built.

Q. WHAT IS THE HISTORY OF THE BSTLM© DEVELOPMENT?

A. Preliminary work on the model started in the last quarter of 1998. Formal development began in the 1st quarter of 1999. The initial version of the BSTLM© was completed in the last quarter of 1999. The current version used in this filing was completed early this year.

The development team consisted of INDETEC International and BellSouth. CostQuest Associates and Stopwatch Maps worked as sub-contractors to INTEDEC international.

Q. EARLIER YOU MENTIONED KEY DESIGN FEATURES, WERE THERE OTHER OBJECTIVES USED BY THE DEVELOPMENT TEAM IN BUILDING THE MODEL?

A. Yes, there were several, including:

- Run on a PC platform
- Distributable in a standard Windows setup package
- Open Platform
  - Use Excel as much as possible to allow easier review by outside parties
  - Auditable

- Support Total Element and Total Service Long-Run Incremental costing principles.

SECTION 2

OVERVIEW

Q. HOW DOES THE BSTLM© DEVELOP REQUIRED LOOP DISTANCE.

A. First, note that a detailed overview of the model methodology was filed with the Commission on April 17, 2000. Obviously, my testimony cannot serve to replace the BSTLM© Model methodology, and those interested in the details of the model should refer to that document.

The BSTLM© is the next-generation approach to understanding the loop costs of an efficient telecom provider. As such, it reflects the forward-looking engineering practices of BellSouth. While it is a new platform, it has its basis in the BCPM, HAI and HCPM models that preceded it.

At its most basic level, the model is simply the development of the best "connects the dots" approach that is available.

In past proceedings in Florida and at the national level, many of the existing models were reviewed and gauged using a Minimum Spanning Tree ("MST"). The MST represents a theoretical minimum amount of plant distance required to serve a set of customers. Using this tool, reviewers could determine that a model built sufficient plant to meet this MST minimum. A model failing this test clearly built too little plant to connect

customers. However, the test could never determine if the model built the right amount of plant.

In continuing the evolution of the loop models, the FCC incorporated the use of the MST in the HCPM. In so doing, the FCC recognized the strength of the MST in determining airline routing from point to point. However, the FCC also recognized that the MST was not a true measure of the required routing but rather a test for the minimum plant distance needed. In order to develop a more accurate routing test, the FCC chose a modified MST. That is, the FCC uses rectilinear routing of the MST to estimate the actual routing that may take place between points.[1] However, rectilinear routing will still lead to overstatements of actual plant distance in some instances and understatements in other instances.

The BCPM sponsors recognized that roads provided the best approximation of telecom routing. However, the BCPM approach did not implement a true road routing of points in the model.

The BSTLM© development team recognized that a major deficiency in the existing proxy models exists in that they unsuccessfully capture the realistic routing that occurs between points in actual telecommunications networks. The BSTLM© represents the implementation of the next generation of model routing. It combines the aspects of the MST with the knowledge of roads and the rights-of-way that the telecom network will

[1] Rectilinear routing assumes that routing occurs at right angle paths to points, rather than along a straight line.

typically route over. This approach is referred to in the documentation (and in the rest of my testimony) as the Minimum Spanning Road Tree ("MSRT"). This a breakthrough approach in that it builds the minimum amount of plant that connects points following the road network.

It is worth noting that the MSRT most likely results in less plant than is actually in place in BellSouth's network. The MSRT represents the minimum road distance with complete knowledge of all current roads and customers. BellSouth's actual cable routes were developed over time in recognition of customer growth patterns and in part during time periods before all current roads were in existence. BellSouth also faces constraints on the use of rights-of-way.

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE MODEL'S DESIGN.

A. The BSTLM© can be thought of as two modules. The first, or pre-processing module, refines data into a format useful for investment determination. The second module is the BSTLM© application. The BSTLM© clusters customers, constructs a wire line network adhering to user inputs and generally accepted engineering algorithms, develops investment and ultimately produces investment data specific to a service or UNE.

Q. WHY WAS THE BSTLM© CONSTRUCTED IN TWO MODULES?

A. The architecture of the BSTLM© is not unlike other proxy models. The functions of customer clustering, network construction and investment determination are open and available to users. The pre-processing module, which is essentially a data preparation process, is computationally intensive and time consuming. Further, the output of pre-processing changes infrequently. To increase the processing speed and turn-around time for most analyses, the data preparation steps are separated from the other modeling components of the BSTLM©.

Q. PLEASE REVIEW THE STRUCTURE AND ARCHITECTURE OF THE BSTLM© APPLICATION.

A. The BSTLM© application is made up of the GIS Process, Edit Inputs area, the Network process (Configuration, Investment, and Summary) and the Reporting process (as depicted in the main screen of the model).

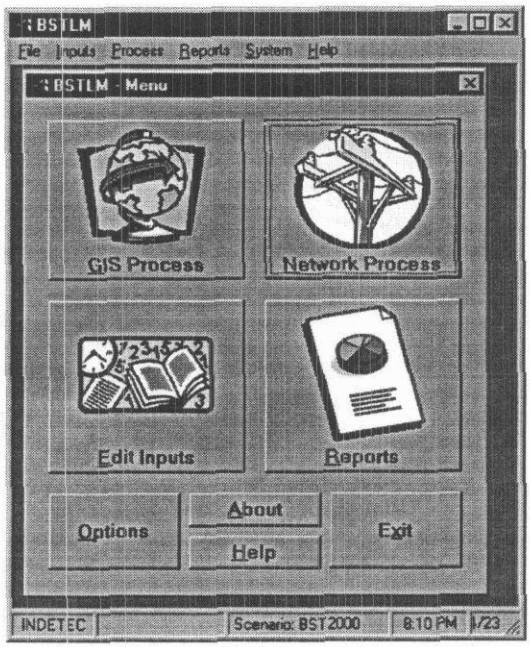

FIGURE 1: BSTLM© MAIN MENU

The GIS process creates the engineering areas, routing, and plant locations. The network process determines the engineering of the network, including the size and type of plant and the necessary investment, and the association of the investment with the services provided. The Reporting process is a dynamic tool allowing the user to obtain a wide variety of information from the model.

The following chart depicts the basic architecture of the model.

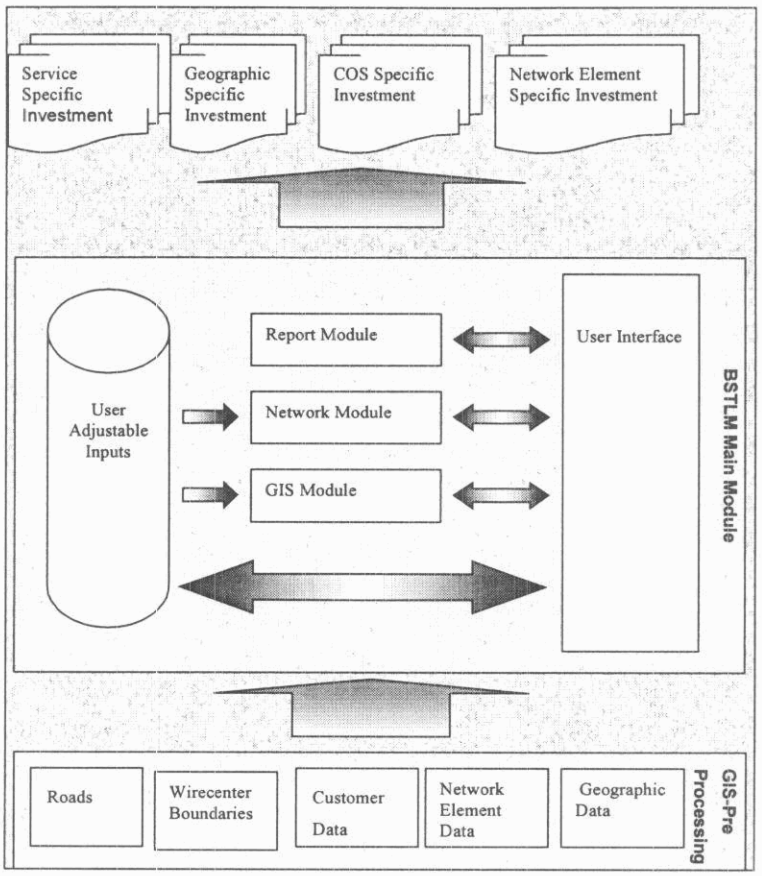

FIGURE 2: BSTLM© ARCHITECTURE

Q. PLEASE PROVIDE A PARTIAL LIST OF THE KEY DESIGN FEATURES.

A. The following are the key design features:

- Based upon BellSouth Engineering practices
- Utilizes BellSouth's customer database
- Includes loops associated with all services and UNEs
- Uses MSRT for creation of the clusters and the routing of both the distribution and feeder network.
- Designs a Scorched Node model using BellSouth's wire center locations

- o Builds the network to the customer
  - The model develops each and every segment of the network. The model starts at the customer location, locates its specific distribution terminal (DT), then runs the specific routing from that DT all the way back to the central office (CO).
- o The model utilizes an improved customer location approach.
  - At its worse, the model is no worse than the HCPM and HAI in determining where customers are located. At its best, the customer location achieves unsurpassed accuracy. When customers are not geocoded, Stopwatch Maps has developed techniques to determine the best estimated placement. This can come from their Zip+4 enhancement and the road surrogation procedure employed. In addition, even with good geocoded customer points, Stopwatch Maps has developed routines that work around recognized deficiencies in typical geocoding output.
- o Complies with all applicable FCC criteria
- o Uses more actual data than any other model
  - Customer and Service points
  - Wire center location and boundary
  - Road Data
- o Includes all processing in the model (including clustering)
- o Can build to working lines, households or housing units.
- o Variable copper distribution design point
- o Ability to provide Total Element Long-Run Incremental costing

- o Recognition of Multi-dwelling units and office buildings and the vertical cabling that may be required in these buildings.

Q. WHAT ADVANTAGES DOES THE BSTLM© HAVE OVER OTHER MODELS?

A. The following highlights the major advantages of the model.

- o Uses more actual data than any other model
  - ▪ Actual BellSouth customer Records
    - • With most advanced surrogation technique
  - ▪ Actual BellSouth wire center locations and boundaries
  - ▪ Road database allows use of MSRT
- o MSRT used to cluster and to lay out both feeder and distribution Network
- o Incorporates impact of all services
  - ▪ Specific engineering
  - ▪ Counts and Dispersion
- o Determines best estimated placement of all plant items
- o Allows modeling of Working Lines, Households and/or Housing Units
- o Model Flexibility
  - ▪ User has control over all inputs
- o Model Accuracy at all levels of geography – Even at the customer level.
- o Audit tools of model to allow understanding of processing.
- o Model Reporting is the most dynamic Loop reporting engine available.
- o Model correctly builds to Multi-Dwelling units and Office buildings

- Model recognizes and places appropriate vertical building cable.

Q. IN PAST PROCEEDINGS IN FLORIDA AND ACROSS THE U.S., THE ISSUE OF A VALID MAXIMUM COPPER LOOP LENGTH HAS BEEN A MAJOR ISSUE. HOW DOES THE BSTLM© DEAL WITH THIS ISSUE?

A. The development team was well aware of the arguments surrounding the appropriate copper loop length to use in a model. In past proceedings, recommended maximum loop lengths generally ranged from 12 to 18 kilofeet. Some parties contended that 18 kilofeet was feasible, while others stated that 12 kilofeet should represent the maximum copper distance due to the additional costs that were caused by attempting to extend copper plant beyond 12 kilofeet and the fact that the ability to provision a variety of wire line services could be impeded.

In creating the BSTLM© model, the development team gave the user control of the cost, efficiency, and physical limitations. The user has the control over two key physical design variables: the soft copper design limit; and the hard copper design limit. The Hard limit provides the maximum distance which copper cannot exceed to provision quality service. The soft limit provides the limit at which most of the network should be built to meet the engineering of all services.

The user also has control over distance related cost variables. BSTLM© provides an input to control the installation of thicker gauge cable. Thicker gauge cable allows for

longer runs of copper cable without hindering the ability to provide the required service level. The model also has inputs that let the user control the installation of extended range line cards. Like the thicker gauge cable, these cards allow the extension of services to greater distances without hindering service levels. The user can control the number of extenders allowed in a single Carrier Serving Area ("CSA") beyond the soft limit. If enough extender customers exist, the economics may indicate that sufficient demand exists for another DLC site. In concert with these smaller line CSAs, the model allows the input of small optical remote. Finally, the model allows the user to determine the extended range break point of each service. In total, the model is the most complete approach to this complex subject and should provide a common solution that is agreeable to all.

SECTION 3

GIS DATA INPUTS

Q. DOES THE BSTLM© USE BELLSOUTH SPATIAL INFORMATION, SUCH AS CUSTOMER SERVICE ADDRESSES?

A. BellSouth made use of customer specific data such as service addresses (already contained within billing systems) by geocoding each customer address.

Geocoding allows a simple address to be converted into spatial coordinates, i.e., to be located on a map. Each geocoded customer location is associated with the services actually provided to that customer.

Q. PLEASE DESCRIBE WHAT GEOCODING IS AND HOW IT WORKS.

A. In basic terms, geocoding allows an address to be identified on a map. The process begins with two pieces of data: the customer address; and the road segment corresponding to that address. The segment of road containing an address, generally one block in length, is a part of a large group of road segments. This large group of roads segments known as a *road network* includes most, if not all, of the roads within a certain area. In the case of geocoding BST's Florida customers, the road network for the entire state of Florida was used.

Each road segment is associated with a street name and address range. A geocoder takes an input address, a BST customer address for example, and matches it to the road segment sharing the same name and address range as the input address.

The table below displays some of the information that may be associated with a road segment. Each side of a street has associated data such as Census codes, Federal Information Processing Standards (FIPS) codes, and Feature Class Codes, which are used to identify the classification of a road (for example A41is a Local Road, undivided). Street segments have street name information, address ranges, and ZIP codes.

Street Name	FromLeft	ToLeft	FromRight	ToRight	RecordID	FeatClass	FeatCISF	ZipLeft	ZipRight
10TH AVE E	101	109	102	110	301833271	A	41	32648	32648
10TH AVE E	0	0	0	0	301833275	A	41	32648	32648
10TH AVE E	0	0	0	0	301833276	A	41	32648	32648
10TH AVE W	0	0	0	0	301833249	A	41	32648	32648
10TH AVE W	0	0	0	0	301833250	A	41	32648	32648
11TH AVE W	0	0	0	0	301833245	A	41	32648	32648
1ST AVE	0	0	0	0	27347923	A	40	32680	32680
1ST AVE	0	0	0	0	27347924	A	40	32680	32680

FIGURE 3: ROAD SEGMENT DATA

For example, the first street segment entry in the table might be pictured as shown below.

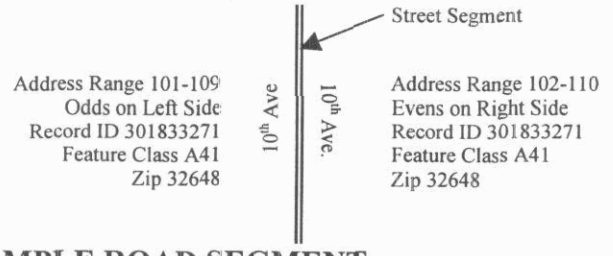

FIGURE 4: SAMPLE ROAD SEGMENT

Notice that the address range associated with the left side of the street segment is different than the address range associated with the right side.

If attempting to geocode the address 103 10th Avenue, the geocoder would first identify the left side of the street segment shown above. It would then measure 25%[2] from the top of that left segment to identify the location of house number 103. The number of addresses covered by a road segment address range determines the percentage of a road segment occupied by each house number. In the case the range 101 – 109, indicates five separate house numbers as shown below.

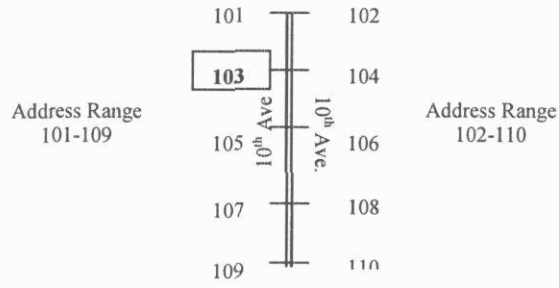

FIGURE 5: GEOCODING EXAMPLE

For more detail on the geocoding process, see the BSTLM© Model Methodology, pages 17-19, Section B.

Q. PLEASE EXPLAIN HOW BELLSOUTH SERVICE ADDRESSES WERE GEOCODED.

[2] The 25% is the result of the fact that there are 4 segments between the five addresses. Therefore, assuming that the addresses start at the beginning and end of the segment, the distance between each of the points represent 25% of the road segment length.

A. All addresses were geocoded using Centrus™ GeoStan™ software in conjunction with GDT Dynamap/2000® Street Network. GeoStan is specifically designed to geocode large batches of addresses minimizing required user interaction. This allows BellSouth to geocode all customer service addresses efficiently and frequently.

NAD 83 datum was employed as a GeoStan geocoding parameter. All geographic data including geocoded addresses, wire center boundaries, and roads share the same NAD 83 datum.[3]

Q. WHY WERE GDT ROADS SELECTED?

A. Qualitative Marketing Software has specifically designed GeoStan to work in conjunction with GDT Dynamap/2000 Roads. The Dynamap/2000 product primarily contains publicly available road information developed by the US Census Bureau. However, GDT continuously improves this data with as many as one million changes each quarter, including new streets, changes to road names, and ZIP code revisions. The Dynamap/2000 product now contains more than 14 million addressed street segments nation wide.

[3] See BSTLM Model Methodology, page 19, Section 1.1.

The accuracy of the roads used in the geocoding process will directly affect the validity of the geocoding outputs. To maintain validity, BST updates the road network used in the geocoding process every two months.[4]

Q. CAN ALL ADDRESSES BE ACCURATELY GEOCODED?

A. No. Unfortunately, not every address can be properly matched with a road segment resulting in an accurate geocode. However, many levels of geocoding accuracy can be produced, and GeoStan produces a location code that can be used to identify the level of accuracy achieved for each input address.

For the purposes of this model, BST chose to only accept addresses that had been geocoded to the address level, resulting in an AS0 location code[5], or a ZIP+4 centroid identified by a Z*9a, Z*9A, Z*9b, or Z*9B location code[6]. All customer locations that were not geocoded with one of these (very high level of accuracy)location codes, were set aside to be surrogated by the GIS Preprocessing module, which is described later in my testimony.[7]

[4] See BSTLM Model Methodology, pages 18-19, Section 1.1 and Appendix B, page 2. The Dynamap release 3/1/1999 was utilized.

[5] An AS0 location code identifies addresses that have been matched to the proper position and side of the correct street block. This level of geocode success is frequently described as "to the door step." The ASO code represents this level of success only when using Centrus Geostan geocoding software.

[6] Centrus GeoStan software generates Z*9a, Z*9A, Z*9b, or Z*9B location codes when an address can be matched to the correct ZIP+4 centroid. This type of location typically locates an address to the middle of the correct street block.

[7] See BSTLM Model Methodology, page 17, Section B; page 19, Section 1.1; and page 21, Section 2.

Q. WHEN A CUSTOMER RECORD DOES NOT GEOCODE WITH AN ACCEPTABLE LEVEL OF ACCURACY, WHAT HAPPENS TO IT?

A. When a customer address is not geocoded to the address level (AS0) or ZIP+4 centroid (Z*9a/b) level of accuracy, the latitude and longitude (the geocoded location) is discarded. This does not mean the entire record is eliminated. Rather, the existence of the customer and the service types associated with known BST customer are retained, and the location of the customer is surrogated.

Q. HOW IS A BELLSOUTH CUSTOMER LOCATION SURROGATED?

A. Customer locations are surrogated, that is placed randomly along roadsides within Census Blocks containing a deficient number of households or firms. A deficiency in the number of households is determined by comparing the number of households reported by the Census to be within a Census Block, to the number of BellSouth customers successfully geocoded (as described above) to road segments within that Census Block. This same approach is used to identify business location deficiencies using PNR[8] firm counts.

Q. HOW DOES THE BSTLM© SURROGATION APPROACH COMPARE TO THAT USED BY THE HCPM?

[8] Obtained from PNR and Associates. This dataset is based on their Access Line Model that estimates access lines and locations throughout the U.S. This data has been used by the BCPM, HCPM, and HAI models.

A. Both BSTLM© and HCPM surrogation methodologies rely upon a comparison of geocoded locations to household (Census) and firm (PNR) counts to determine the number of locations that must be surrogated. These methodologies also generate surrogate locations along roads within deficient Census Blocks.

However, the BSTLM© and HCPM generate surrogate locations differently. The HCPM elects to space surrogate locations evenly along the road network within deficient Census Blocks. The BSTLM© surrogation process randomly places surrogate locations along roadsides. Furthermore, because the BSTLM© surrogates actual BellSouth customers, unlike other models, the exact services associated with a customer are retained no matter where the location is surrogated.

Q. PLEASE CHARACTERIZE BSTLM©'S USE OF CUSTOMER & SERVICE DATA.

A. BST customer data (including telephone number, service address and service types associated with that line) was extracted from the Customer Records Information System (CRIS) and Carrier Access Billing System (CABS) databases. The resulting customer addresses were then geocoded using Centrus™ Geostan™ geocoding software produced by Qualitative Marketing Software, as described above. Once geocoded, the customer data is entered into the GIS Preprocessing module of the model.

Customer Records Information System customer data was extracted from a December of 1998 file. Carrier Access Billing System data was pulled in June of 1999.

Q. PLEASE DESCRIBE THE USE OF BST'S PLANT DATA.

A. Wire Center boundary maps were digitized by a BellSouth organization known as the Regional Landbase Administration Center (RLAC). These digitized boundary maps were updated during the second half of 1999.

The locations of all BST switches were generated and geocoded by BellSouth and updated by the BellSouth Regional Landbase Administration Center during the second half of 1999.

SECTION 4

GIS PREPROCESSING

Q. PLEASE DESCRIBE THE GIS PREPROCESSING MODULE.

A. The GIS Preprocessing module is a series of programmed procedures whose purpose is to prepare the data required by the GIS processes of the main module. The preprocessing procedures take, as input, data provided by BellSouth (customer locations and services, switch locations, wire center boundaries) and available reference data (roads, Census Block boundaries, demographics, and ZIP+4 centroids). This data is modified for use in the BSTLM©.

Q. WHY IS PREPROCESSING USED?

A. The preprocessing is a voluminous task, requiring a great deal of computing resource. For example, the entire road network of a state must be split up by wire center. For each wire center the relationship of all road segments, one to another, and the relationship of every customer location to the road segments, must be established. Furthermore, the amount of reference data that is required during the preprocessing consumes a number of gigabytes of disk space. It would be an inefficient use of disk space and processing time to include the preprocessing steps in the main module of the BSTLM©. In addition, there are no user controlled inputs or algorithms that need be maintained. The preprocessing steps simply provide an association of massive amounts of data. Therefore, the preprocessing procedures have been designed to be performed by BellSouth before

distribution of the BSTLM©. These procedures have been designed such that BellSouth can re-run the preprocessing procedures in the future with updated data.

Q. WHAT DATA DOES BELLSOUTH PROVIDE TO PREPROCESSING?

A. BellSouth provides an already-geocoded set of customer locations, one record for each BST customer in the state (business, residential, or special access line) including the customer's telephone number, serving wire center, service address, and ZIP code. BST also provides a file of the set of services delivered to each customer.[9]

BellSouth also provides the latitude and longitude of each its switches. Finally, the actual boundary of each BST wire center is provided by BellSouth, from its own map files; this is not an "estimation" of the boundary as might be obtained from some independent sources.

Q. WHAT ADDITIONAL REFERENCE DATA IS USED IN PREPROCESSING AND WHAT ARE THE SOURCES OF THIS DATA?

A. The largest set of external data is the set of roads for the state, provided by GDT's Dynamap/2000 Street Network. This data matches the street data used for geocoding. The road segments represent the possible cable routing paths to be used by the GIS module.

[9] This file is related to the first through the telephone number in the record.

Census Block Boundaries, and county boundaries, are obtained from Stopwatch Maps, Inc. of St. Louis (derived from US Census Bureau's TIGER 97). Stopwatch generated the estimated household and housing unit counts for 1997 from other Census Bureau sources. The estimated business firms and business lines per Census Block are obtained from PNR's Access Line Model, of 1997 vintage. This demographic information allows for the surrogation of customer locations to be concentrated in areas deficient of properly geocoded customers as described previously in my testimony.

Stopwatch also provided an enhanced set of ZIP+4 centroid points, derived from United States Postal Service (USPS) sources with additional analysis performed. ZIP+4 centroid points are used in the location of some customers not successfully geocoded.

Q. BRIEFLY DESCRIBE THE STEPS USED IN THE GIS PREPROCESSING PROCEDURE.

A. The procedure includes the following steps:

- Roads Preparation: This step takes road data that is provided in Dynamap/2000 by county, and joins and cuts that data to generate the necessary road information specific for each wire center. Duplicate GDT segments are eliminated, partial segments are concatenated, and each segment's length (along its possibly curved route) is calculated. The resulting segments for the wire center are tested for

continuity and, if necessary, minimal additional segments are generated to form a complete graph. The adjacencies of all segments and intersections are determined. For each wire center, this very long step produces the road segments and the adjacency list which (after they have been assigned to a specific switch in the next step) become inputs to GIS processing.

- Switches Preparation: This step collects and records all switches in a wire center, then determines the main switch in each central office which will serve as the point from which all cable paths emanate in that wire center. The nearest road point for the switch is determined, and the shortest road path distance of every intersection from the switch is calculated. The roads tables produced in the previous step are assigned, in each wire center, to the main switch of that wire center.
- Census Blocks Preparation: This step associates the boundaries and the residential and business demographics of each Census Block with the wire center in which it falls. If a Census Block spans wire center areas, the Census Block is cut at the boundary and the demographics are assigned to the part in each wire center proportionally to the area of the Census Block that falls in each wire center. This Census Block information is used in the surrogation process in Customer Preparation.
- Services Preparation: This step validates and associates service records, by matching telephone number, with the customer being served. The business/residential nature of the each customer is determined from the service

records. Each customer record is pointed to the set of service records that apply to that customer.

- Customer Preparation: This step relates customer records to all the other information that has been prepared. First, the wire center into which each successfully geocoded customer actually falls is determined.[10] Next, for each location not successfully geocoded but with a ZIP+4 in its address, if that ZIP+4 has a known valid centroid (in the supplementary ZIP+4 table cited earlier), that customer is assigned to that ZIP+4 centroid.[11] This determines the wire center in which it falls.

Then, for each wire center:

- Locations of customers geocoded to an exact address are examined and, if appropriate, those locations are "rectified" (spread along the block) to overcome the "bunching" phenomenon that may have resulted from geocoding with very general address ranges for each street block.[12]
- Locations of customers geocoded (or later assigned) to a ZIP+4 centroid are spread along the block where the range of that ZIP+4 is one side of a street block.
- For each customer not successfully geocoded, a location along a road segment in the wire center must be assigned by surrogation. After it has been determined which geocoded customers fall in which Census Blocks, Census Block business

[10] Here, "successfully geocoded"means geocoded to the exact address or to the ZIP+4 centroid.
[11] A "centroid" is the geographic center of geometric shape. Usually it is the gravity center (where each point's distance from the centroid is given a squared weight) of a two-dimensional plane polygon.
[12] For example, the street address range may be from 6801 to 6899, but actual addresses may only range from 6801 to 6837.

and residential demographics are used to determine the Census Blocks which lack the expected number of customers of each type. Unlocated customers are then assigned to Census Blocks proportional to the "shortage" in each Census Block, then assigned to a random location within that Census Block.[13]

- Because the BSTLM© can build telecommunications plant not only to existing customers, but also to the total set of households and to the total set of housing units within a wire center, surrogation of additional households and additional housing units is also performed, on a proportional basis. These additional locations do not correspond to existing customers; they are assigned only the simplest POTS service, and they are used only by specific request by the model user. BellSouth chose, for this filing, to build only to existing customer locations.
- Customers located at the same service point (units in an apartment, different firms in the same building) are grouped so that a single record represents all customers at each unique location (each service point). The services for each of those grouped customers are collected together, and the customer service point record is made to point to a grouped set of services.
- For each of these service point locations, the nearest road point is determined (the specific road segment, and a distance from the beginning point of that segment, to which that customer location is closest).
- For each of these service point locations, the shortest distance from the switch along roads is calculated

[13] See BSTLM Model Methodology, page 22, Section 3.

The customer preparation step process results in two tables: one of customer service points (and their attributes); the other of the services for those service points.

Q. YOU MENTION THAT THE GEOCODED CUSTOMER DATA HAD TO BE RECTIFIED. WHY IS THIS DONE?

A. The bunching of geocoded locations toward the beginning of a road segment is a common problem in geocoding programs. As I described previously in my testimony, a geocoder is dependent on its underlying road data for the address range of each road segment. Remember that a road segment is typically a block in length. Very often, the address ranges are too broad in the underlying road data (for example, the address range of a segment may be recorded as xx01 to xx99 when the real range might be xx01 to xx25). When geocoding to exact address on a segment (location code AS0), a geocoder assigns the point to a distance from the start of the segment that is appropriate in the recorded address range. Thus, in the example given, all real addresses (xx01-xx25) would be placed in the first quarter of the segment.

On the basis that the BellSouth customer dataset generally represent the full range of addresses in each block, the code "rectifies" the bunched placement by the geocoder by *spreading* the geocoded locations along the block. This should yield a more realistic placement of these customers, and a more realistic set of model results.

Q. WHAT ARE THE OUTPUTS OF THE PREPROCESSING PROCEDURES?

A. At the completion of all the preprocessing steps, the data required by the GIS processes of the main module (with the required relationships in that data, and in the required form) have been produced for each wire center. This data includes the following:

- o Road segments
- o Any additional minimal segments required to form a complete graph
- o The adjacency relationships of the intersections and segments
- o The customer service points locations, with their road and switch relationships
- o The services delivered to these customer service points.

In addition, on a statewide basis, a table of wire centers and their switches are produced, as required by the GIS processes of the main application.

Q. PLEASE CHARACTERIZE THE FLORIDA CUSTOMER INPUTS INCLUDING THE RATE OF GEOCODING SUCCESS THROUGHOUT THE STATE.

A. Approximately 5.05 million BST customer records were extracted from the Customer Records Information System and the Carrier Access Billing System databases to be used in this model. This number indicates the total number of known BST customers. Of that number, 4.05 million were geocoded to the address or AS0 level accuracy. A remaining .56 million records were geocoded to an acceptable ZIP+4 centroid, or Z*9a/b level of accuracy. An overall geocode success rate of 91% was achieved.

The following table summarizes the geocoding results found in Florida:

Florida Geocoding Results							
Geocode Success Rate	Number of Wire-centers	% of All BellSouth Florida Wire centers	Address or ZIP+4 Centroid Geocode	Surro-gated Locations	Total	% Address or ZIP+4 Centroid	% Surro-gate
>90%	120	61%	3,747,112	198,664	3,945,776	95%	5%
80 to 90%	34	17%	654,022	109,032	763,054	86%	14%
70 to 80%	14	7%	117,943	37,104	155,047	76%	24%
<70 %	28	14%	86,672	103,029	189,701	46%	54%
Total	**196**	**100%**	**4,605,749**	**447,829**	**5,053,578**	**91%**	**9%**

FIGURE 6: FLORIDA GEOCODING SUCCESS RATES

SECTION 5

BSTLM© MAIN MODULE – GIS MODULE

Q. PLEASE BRIEFLY DESCRIBE THE GIS PROCESS.

A. Within the Main BSTLM© model, the GIS module is responsible for modeling the network for a wire center. Network components required to serve the customers are determined, and cable routes are constructed that connect the components to the switch. The module uses datasets produced by GIS preprocessing (customer location and service information, switch locations, and road networks) and algorithms designed to adhere to standard loop engineering guidelines.

There are five steps the GIS module performs to model the network for a wire center. Before these five steps occur, all locations whose service requirements demand an on-site DLC (e.g., office buildings or apartment buildings) are identified. These locations are eliminated from the distribution terminal (DT)/building terminal (BT) placement and clustering steps (steps 1-4) outlined below. In the fifth step, these locations and their customers return to the modeling process when feeder cable is routed to all DLCs, including these on-site DLCs.

1. DT/BT Placement: Customer locations requiring a BT are identified and assigned a BT. All other customer locations are assigned to DTs using an algorithm that optimally places the DTs along roads. In the following steps, these DTs (and BTs) are the units for clustering. That is, when a DT is clustered, all of that DT's

customers are implicitly clustered. (See IV.B.1 pg. 25 of the Model Methodology).

2. Allocation Area (AA) Clustering – DT/BTs that are within a user-defined distance of the switch – typically 12,000-ft – are clustered into AAs. The module measures all distances between entities of the network along roads. Therefore, the DT/BTs must be close enough to the switch, as measured along the roads, to fall into an AA. The module constructs the Minimum Spanning Road Tree (MSRT) for all candidate DT/BTs, then splits the tree into AAs. The MSRT is an optimized tree that connects the DT/BTs using paths that follow roads. The original MSRT is preserved and defines the distribution cable paths for the AAs. (See IV.B.2 pg. 27, of the Model Methodology).
3. Carrier Serving Area (CSA) Clustering and Digital Loop Carrier (DLC) Placement: All remaining DT/BTs (i.e., those too remote to be clustered into AAs) are clustered into CSAs. The module constructs the MSRT for all of these DT/BTs, then splits this MSRT into CSAs. A DLC is optimally placed for each CSA at the location closest to the switch that minimizes customers requiring thicker gauge distribution cable. The distribution cable paths for each CSA are defined by the original MSRT.
4. Feeder Distribution Interface (FDI) Placement: The module places one or more FDIs along the cable paths of each AA and CSA. The service demand and cable configuration of the AA/CSA dictate the number of FDIs that must be placed. (See IV.D.3 pg. 35, of the Model Methodology).

5. Feeder Routing: Feeder is routed to the AAs by building a constrained MSRT. The constraint requires that the feeder route to the AA must not produce customer loops longer than the design limit for copper. Next, the module constructs feeder routes to the DLCs in the CSAs. The wire center is divided into quadrants (N, S, E, and W) and a separate MSRT for the DLCs of each quadrant is built. This produces up to four distinct trunks of feeder cable emanating from the switch. (See IV.D.1 page 37, of the Model Methodology).

Upon completion of these steps, the engineering layout of the wire center network is defined. The module enriches the data by adding to it other cost-influencing factors. This includes tracking where feeder and distribution cable routes are shared and calculating the line density for each individual network component. (See IV.E and IV.F, page 38, of the Model Methodology).

The final task of the module is to prepare the data into two files for the succeeding processes of the model. Customers are related to a DT, BT, or on-site DLC; this information and the customer's associated services are saved as the first output of the module. The network components are related to one another using a parent chain that defines the distribution and feeder cable routes. This association along with the DT/BTs of a CSA, the route-length to the DLC, as well as the route-length to the central office (CO) is saved as the second output of the module.

The following illustrations show the network modeled by the GIS process for the Dunnellon, FL wire center – DNLNFLWM – using a design limit for copper distribution of 12,000-ft, a hard limit of 13,000-ft for AAs, a hard limit of 18,000-ft for CSAs, and a line design limit of 1,800 lines.

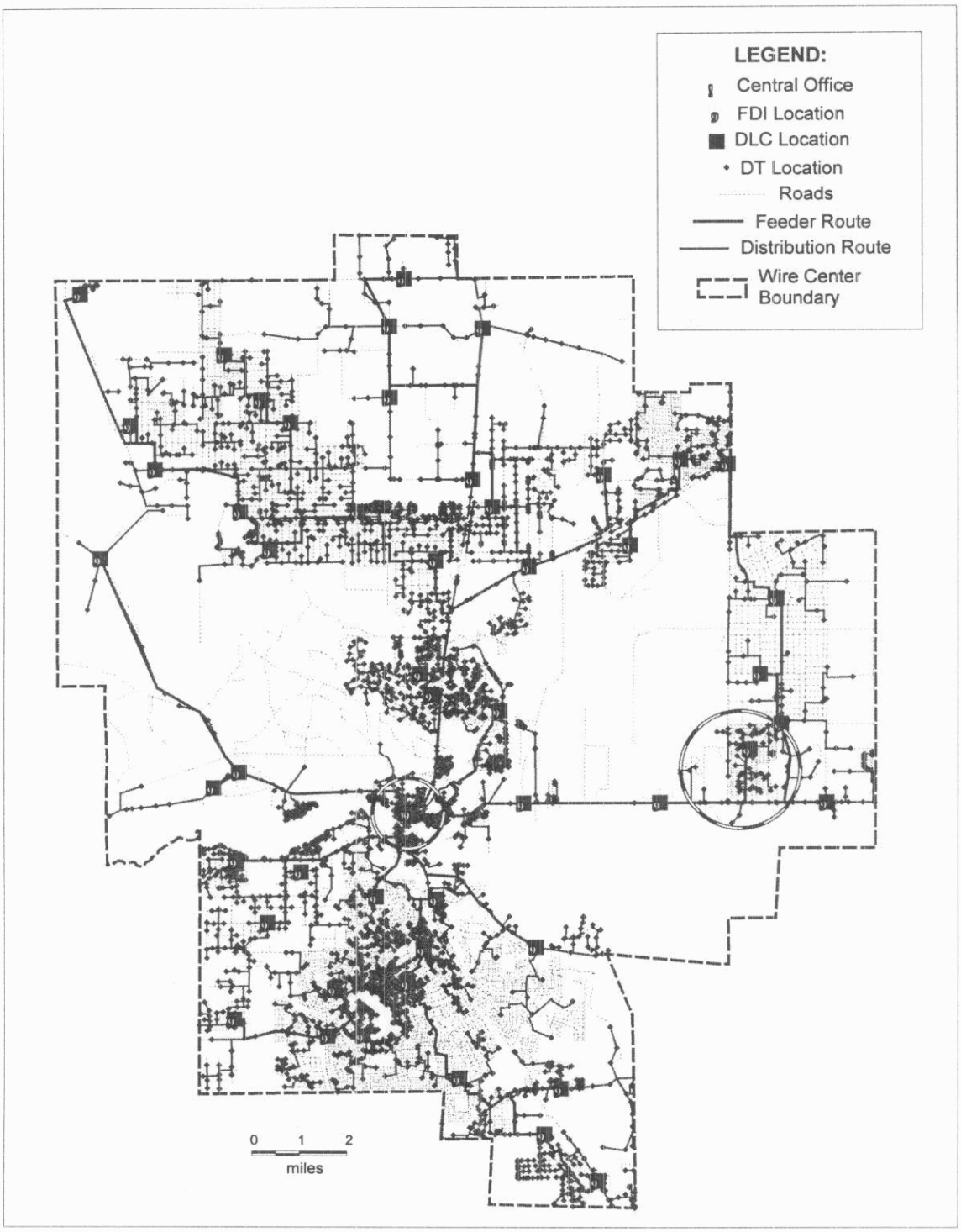

FIGURE 7: ILLUSTRATION OF BSTLM© MODEL FOR DUNNELLON

Below are two close-ups of the circled areas in the preceding picture. The first illustrates the area around the switch, where AAs are modeled. The second shows a CSA and its distribution network.

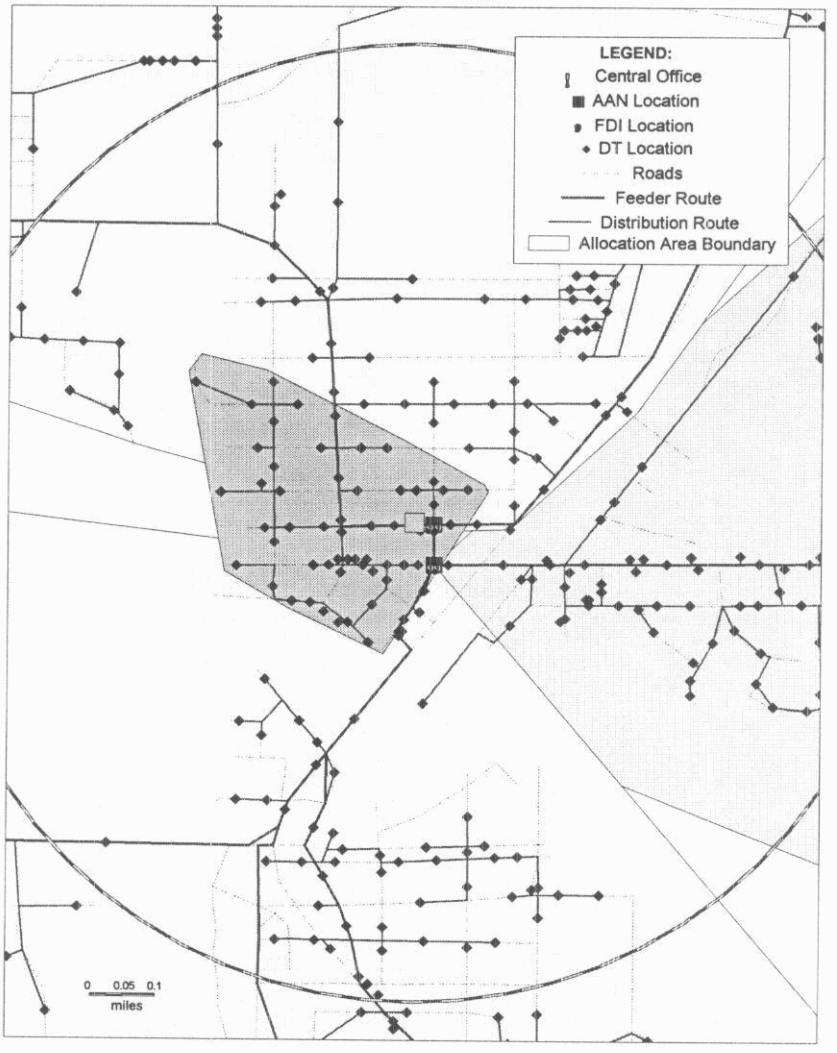

FIGURE 8: ILLUSTRATION OF ALLOCATION AREA (AA) DESIGN

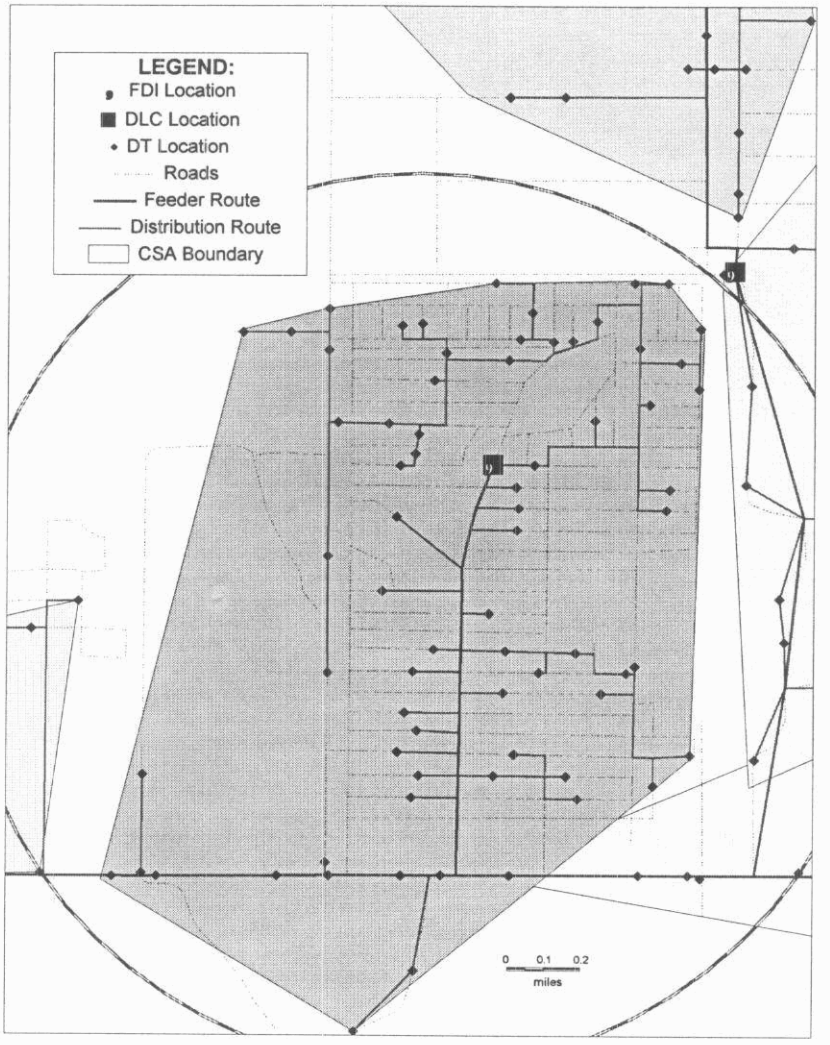

FIGURE 9: ILLUSTRATION OF CARRIER SERVING AREA (CSA) DESIGN

Q. EARLIER YOU DISCUSSED THE MSRT. PLEASE DESCRIBE THE APPLICATION OF THE MSRT CONCEPT TO THIS PORTION OF THE MODEL.

A. The MSRT represents the shortest path connecting a set of points using road segments. When clustering AAs and CSAs, the set of points are the DT/BTs of the wire center. For constructing feeder routes, the DLC locations define the set of points.

The MSRT provides a realistic representation of cable routes because it follows roads, which typically parallel the rights-of-way that must be followed when designing a network. This approach is superior to MST tests or rectilinear routing in that it produces the most accurate and realistic representation of the minimum cable distance that would be required.

The following illustrations compare the MSRT of a CSA from the Dunnellon wire center to its MST. Note how the MSRT paths follow roads. The total length of the MSRT is 61,010-ft, compared to 46,853-ft for the MST. The MSRT is 30% greater than the MST in this example. If the MST were utilized to estimate or test route distances, then the route distances would be understated, in this example, by more than 14,157-ft. The MST distance could only be realized if one could ignore rights-of way constraints and build the network "as the crow flies" right through private property. The use of the MSRT appears to be more accurate and more realistic.

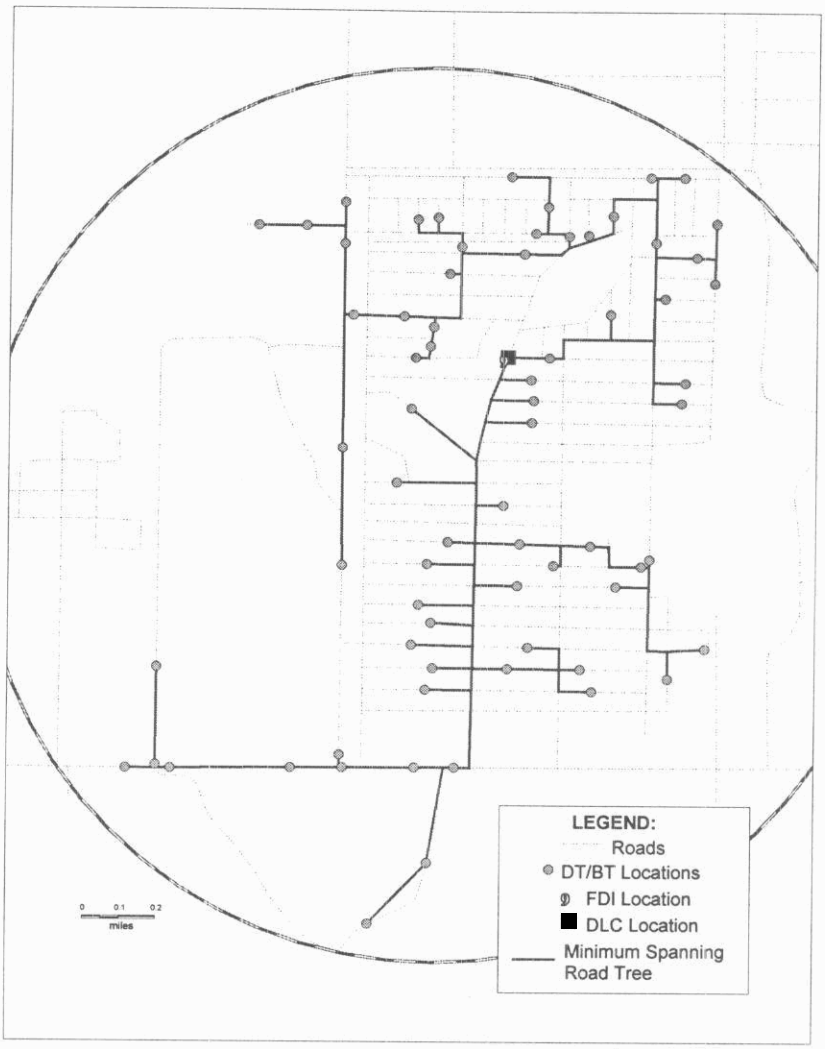

FIGURE 10: MSRT DESIGN

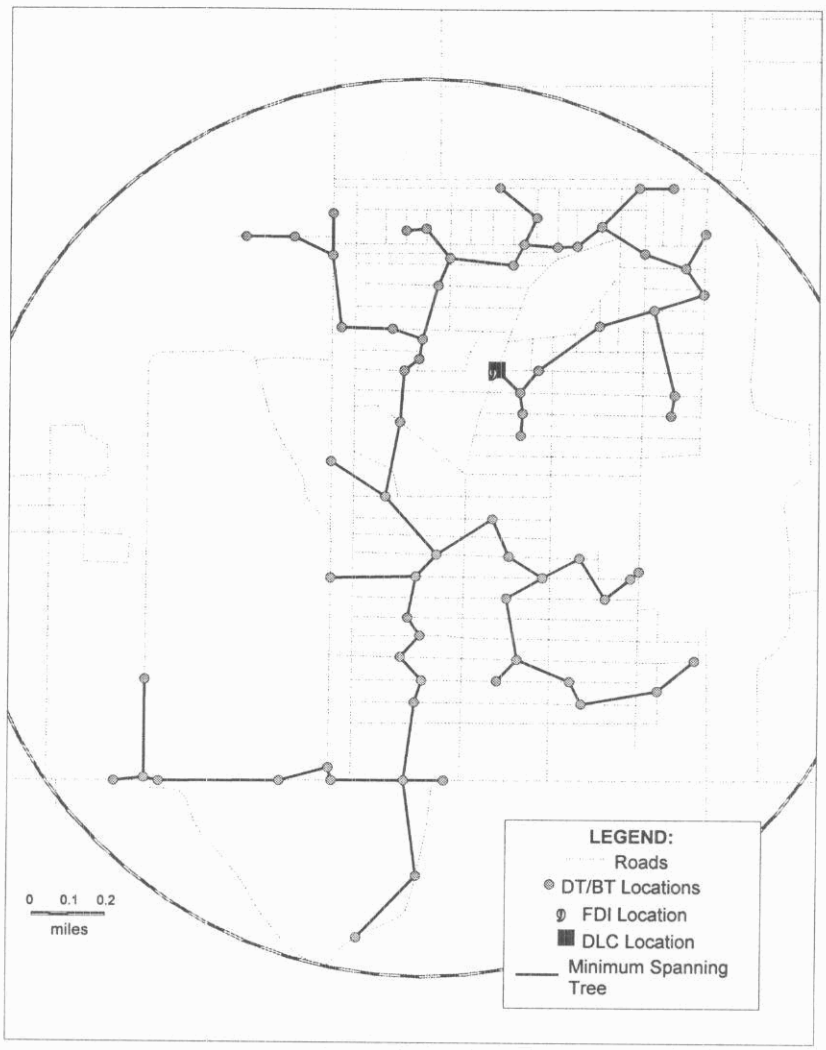

FIGURE 11: MST DESIGN

The MSRT also has the advantage of measuring the proximity of points along roads. This helps the model produce more realistic clusters. For example, consider two DTs that are 3,000-ft apart as the crow flies. A model using straight-line distances is likely to cluster these two DTs together. However, if a river separates the two DTs and the shortest road-based route between the two uses a bridge that crosses the river 6,000-ft

upstream, the total distance for this route is 15,000-ft. This is the distance the MSRT uses making it less likely that these two DTs will be clustered together.

To further illustrate the point, imagine if DTs were clustered to the CSA from the above example using straight-line (as the crow flies) distances to measure proximity. Using a 13,000-ft limit, the size of the CSA effectively doubles in size from 71 DTs to 150 DTs. The following graphic shows the CSA clustered using straight-line distances along with the original CSA clustered using the MSRT.

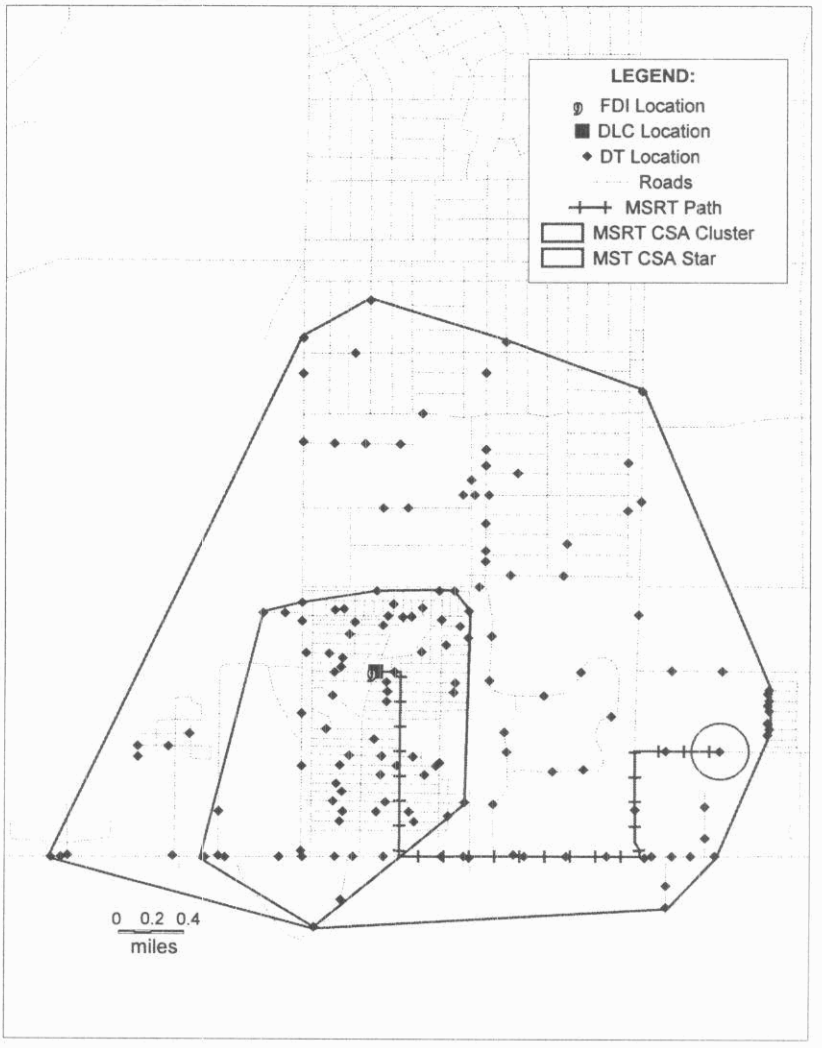

FIGURE 12: MSRT –VS- MST CLUSTERING

Note the circled DT – it is only 11,300-ft from the DLC measured straight-line. However, its shortest path to the DLC along roads, depicted by a hatched line, is 20,780-ft – a distance much too long for distribution cable.

In contrast to previous loop models, the MSRT also builds unique distribution routes along the roads from the FDI to the actual location of the DT, which is placed based on

the actual location and demand of the customers. The following illustrates the distribution cable modeled for a DA using the MSRT.

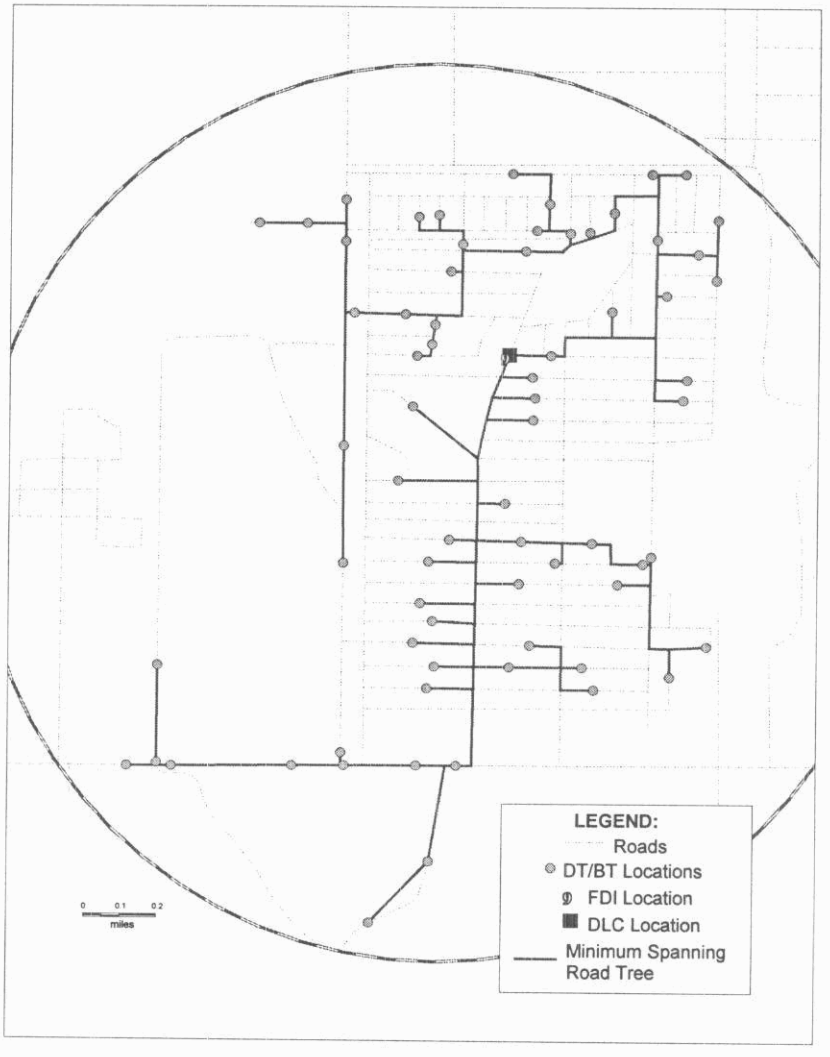

FIGURE 13: MSRT DISTRIBUTION AREA (DA) DESIGN

Below is the same DA modeled using the rearrangement of customers that has been used in prior models (e.g., the HAI Model).

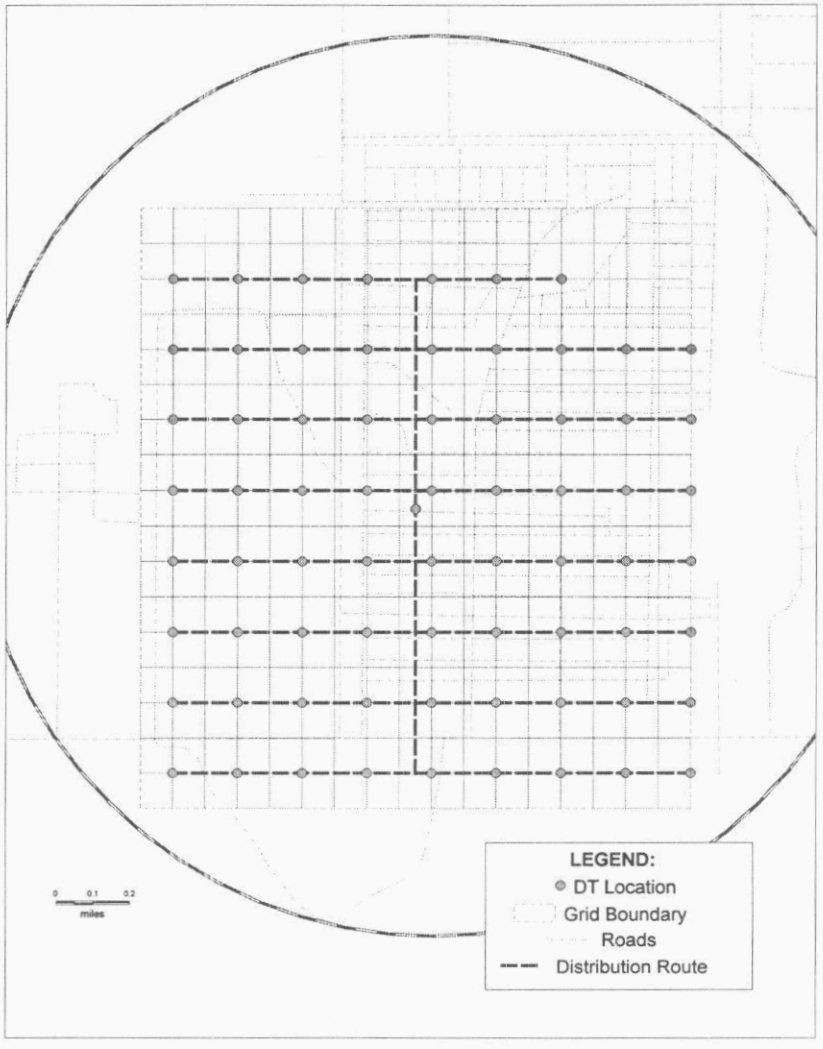

FIGURE 14: EXAMPLE OF DA DESIGN IN OTHER MODELS

Finally, the MSRT adds another level of realism to the modeling process not present in prior models. The distribution network in the BSTLM© is built to the customer instead of moving the customer to the network. The proxy models determined the engineering area from the customer location data. Once these areas were defined (Road Reduced Quadrant of an Ultimate grid in the BCPM, rectangle with area of the Cluster in the HAI,

and Grid in the HCPM), the models ignored the actual customer location and dispersion and built a network in these areas assuming equal customer dispersion.

SECTION 6

OVERVIEW OF CONFIGURATION PROCESS

Q. PLEASE EXPLAIN THE CONFIGURATION PROCESS.

A. When the GIS Process is complete, the initial network has been "constructed". Network components are placed and either feeder or distribution media connect the components. The configuration process refines this network by sizing cable based upon demand, and placing appropriate electronic equipment. Customers that require special provisions due to distance from the switch or DLC are identified.

The configuration process does this by examining each network component and selecting the appropriately sized component. Each span along the network is examined and then sized in accordance with generally accepted engineering algorithms and user inputs.

Q. PLEASE BRIEFLY DESCRIBE HOW THE CONFIGURATION PROCESS WORKS.

A. The configuration process goes through a series of functional steps or procedures. I will briefly outline them below. More detail is provided in the BSTLM© Methodology Manual.

The configuration process begins with the output of the GIS Process. Every record in the complete wire center network is examined. For a wire center, this may mean examining

between 1,000 and 100,000 records Each record represents either a plant component or a service location. The following steps are performed:

- o Identify service points requiring extended range provisioning from a DLC. These customers are identified with an "X" after their service code.
- o Determine the density zone and density group of each record. This is done as a look up from the GIS data to the user adjustable density table.
- o Determine the direct and cumulative cable counts to all network components. Each network component (Network Interface Device, DT/BT, FDI, etc) is sized using the pair and single channel (DS0) equivalents demanded upon that component. Network routes (copper and fiber sizing) are determined using the cumulative count of pair and DS0 equivalents.
- o Determine the cable type on the route, fiber or copper.
- o Determine the cable gauge based upon the longest loop in each distribution area and the value of the CSA24/26GaugeXover or AA24/26GaugeXover.
- o Determine the plant mix. This determination is made based upon the user adjustable rules presented in the plant mix table and the characteristics of each examined component.
- o Determine the appropriate size for cable and network components. Types, as well as sizes, for DLC, FDI, DT/BT, and Network Interface Devices are also determined.
- o Determine feeder rings, gather DLC-RT locations and place them on feeder rings.

The configuration process concludes by setting indicators needed for the reporting process. When this is complete, the data is ready for investment determination.

SECTION 7

OVERVIEW OF INVESTMENT PROCESS

Q. PLEASE BRIEFLY DESCRIBE HOW THE INVESTMENT PROCESS WORKS?

A. The investment process uses Excel logic to determine the material and other capital related costs of the loop network (referred to as the engineered, furnished and installed - EFI investment). The process takes information on the size, type, length and other information on network components from the configuration process. For most of the network components, the process is fairly simple and straightforward. Based on the network component and either the length, size, or type of plant, the investment logic looks up the user supplied inputs for material costs. It then multiplies this user input by the length for media for copper and fiber costs. For DTs and BTs, the calculation is simply a lookup of the material cost based on the required size.

While most of the network component costing is relatively straightforward, the DLC and SONET costing in the model are quite dynamic. For DLC costing, previous loop models used a simple approach by allowing the user to input only the system costs for a few standard sizes of DLCs. In addition to these standard system costs, the user input a single per channel termination costs (Plug-in costs). In contrast, the BSTLM© sizes the DLC equipment at each site specific to the services and demand that exist at the site. This includes establishing specific types of line cards needed for each service. The figures attached as exhibits JWS-2 and JWS-3 provide an example of the DLC sizing that occurs for each system. As you can see from these figures, the DLC equipment is sized

appropriately for the services and the demand. A similar approach is use in the SONET calculations.

Once the investment process develops the total material costs and the total engineered, furnished and installed costs, it then determines the per unit costs. The material and/or EFI per working unit (labeled as Mat@Act and EFI@Act) are derived by dividing the total costs by the working service counts. This is the material and/or EFI associated with the Total Element Long-Run Incremental Costs (TELRIC).

The use of the Investment worksheets by each of the configuration components is overviewed in the table attached to my testimony as exhibit JWS-4.

SECTION 8

OVERVIEW OF SUMMARY PROCESS

Q. CAN YOU BRIEFLY DESCRIBE THE SUMMARY PROCESS?

A. The summary process performs three functions. First, it links the Configuration and Investment files together. Second, it aggregates data. In aggregating costs, the model retains the network configuration and investment of every network component and customer on each segment. Although the segment level data is not available in reporting, it is used in the calculation of aggregated investment.

Third, the summary process determines material investments specific to each service and/or UNE. The development of service and/or UNE specific costs allows the user to understand the cost differences of services and/or UNEs served throughout the service territory. For example, DS1 UNE customers may be located close to the central office while 2Wire Analog Voice Grade UNE customers are spread throughout the wire center. In aggregating costs, the model retains the network configuration and investment of every network component and customer on each segment.

SECTION 9

OVERVIEW OF REPORTING

Q. PLEASE BRIEFLY DESCRIBE THE REPORTING PROCESS IN THE BSTLM©.

A. The reporting process can also be described as a reporting engine because of the similarity to a database engine. That is, the reporting process works by allowing the user to define the exact query, rather than producing a limited set of reports. The reporting process was designed to provide flexibility in reporting. This flexibility is derived through a Reporting Service (or Rservice) definition.

The Rservice is a user-defined combination of Network Elements and Services. The user can select any combination of UNEs/services and either all or specific elements of the network needed to support a study. For example, an Rservice could be defined as the distribution portion of the network which would include the NID, the DROP, the DTBT, the DT-FDI, the BLDGCABLE, and the FDI elements for POTS or POTS like services only. This Rservice definition would generate a report showing costs specific to this Rservice definition.

In addition to the Network Element and Service Selection, the user can also define specific types of loops to study. The available options include: customer type; distance from the switch or DLC; and local loop or local channel designation.

Q. PLEASE PROVIDE AN EXAMPLE OF HOW A REPORT IS CREATED.

A. The user selects the "Reports" button from the main menu. The BSTLM© presents the user with the following menu.

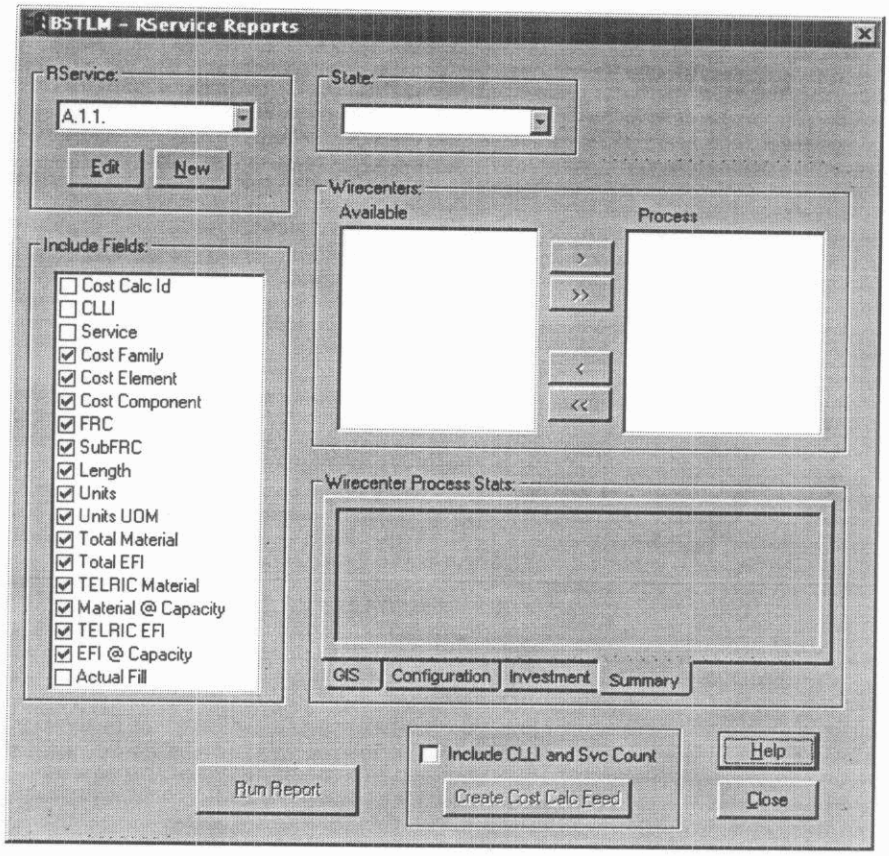

FIGURE 15: REPORTING MAIN SCREEN

Working through this screen, the upper left frame allows the user to select the Rservice definition. This provides a pull down menu allowing the user to select the appropriate pre-defined Rservice. In this example, each Rservice corresponds to a different UNE.

An Rservice is defined using the "New" button. Upon selecting "New" button, the form presented is shown below.

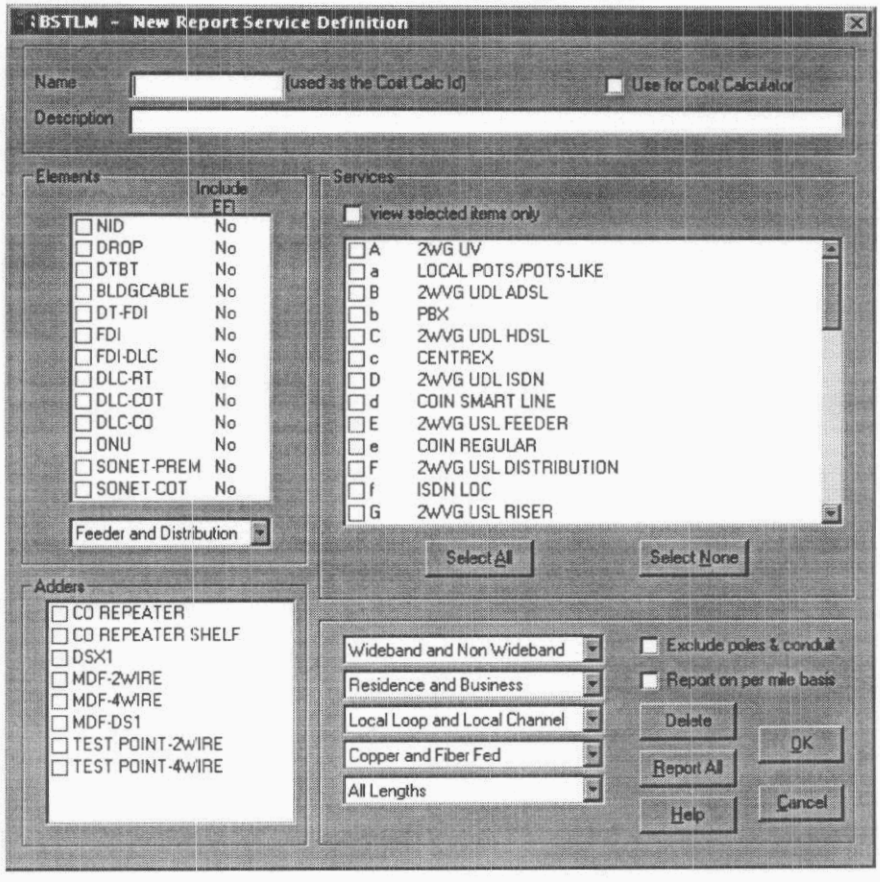

FIGURE 16: R-SERVICE SCREEN

Starting at the top of the form, the user can provide a name and description for the Rservice. The "Use for Cost Calculator checkbox," toward the upper-right, provides a means to identify those Rservices, which will be exported in cost calculator format. That is, the Rservice definition creates a file that is available to the BellSouth Cost Calculator© for expense calculation.

The Elements frame (shown below) allows the user to capture those network elements used in reporting. Only those elements with a selected checkbox will be included in the investment calculation and report. If Engineered Furnished and Installed Investment (EFI) is to be included with an element, the user double clicks to toggle the option.

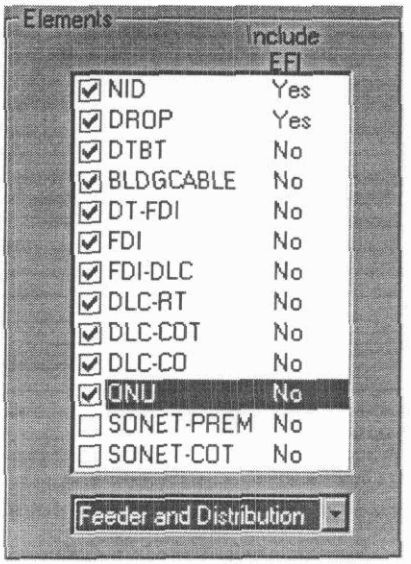

FIGURE17: ELEMENT SELECTION

With regard to EFI, when reviewing reports the EFI column represents only the investment necessary for EFI. It does not include the material investment. Material and EFI investment is the sum of both columns.

The pull down box below the elements list allows the user to select specific plant families. The pull down specifies reporting for only Feeder, Distribution or Feeder and Distribution plant families.

Adjacent to the Element's Frame is the service checkbox. Checking a service will include those specific service records and their associated investment in the results of the selected Rservice. It is possible to select more than one service in each Rservice definition, as shown below.

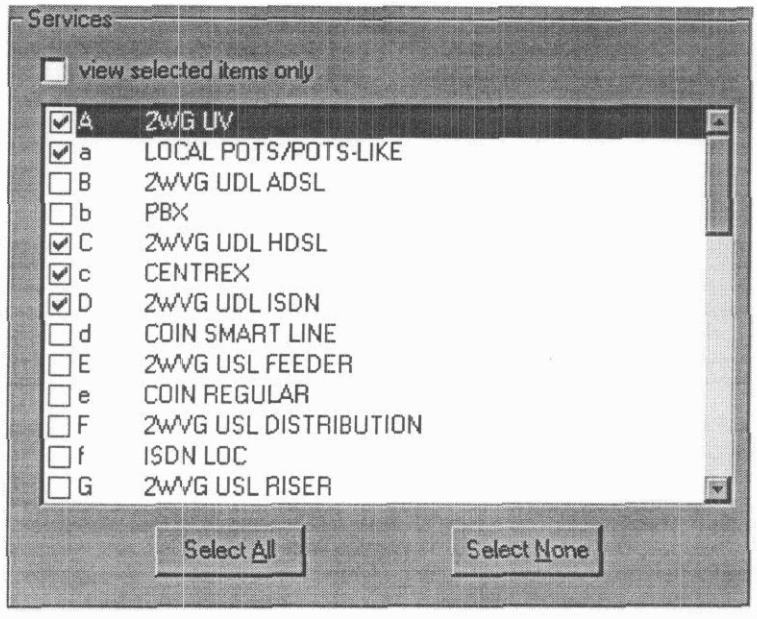

FIGURE 18: SERVICE SELECTION

After the services are selected, the user can select different reporting options. The bottom of the Rservice definition form has a number of pull-down menus. Each menu allows the user to define a specific segment of loops to study. These options include the following:

- Residence and business: This option allows the user to report on residence loops, business loops or both.

- o Local Loop and Local Channel: This option allows the user to report on services that are designated as either local channel, local loop or both.
- o Copper and Fiber Fed: This option allows the user to segment the report on loops that are fed by either copper, fiber or both.
- o All lengths: This option allows the user to segment the report on all loops or loops that are less than 9, 12, 18 or over 18 Kilofeet.

Within the Rservice definition, the user can also select any appropriate adders[14]. The user can also elect to exclude pole and conduit investment, if appropriate. An option to report on a per mile basis is available. Selecting this option will calculate investment for the DT-FDI, FDI-DLC and DLC-CO on a per mile basis for the on-screen reports and for all FRC/Sub-FRCs on the BellSouth Cost Calculator© feed. Cost Elements which are reported on a per mile basis will have an "*" placed next to their name.

After the Rservice is created, clicking the OK button saves the definition. The BSTLM© will then return to the Report window.

At this point, the user should specify the geographic area for reporting. This is done by first selecting the state and then the appropriate wire centers. Finally, the user can select the fields to display on the output report, shown below.

[14] Adders refer to network component costs that are not modeled in the logic of the BSTLM but are simply "added" onto the costs of the modeled services.

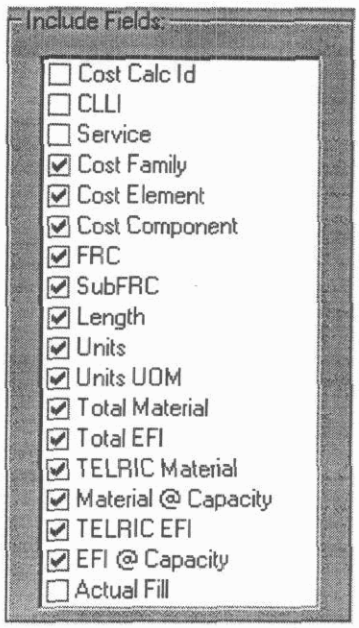

FIGURE 19: REPORTING FIELDS

The field's frame specifies the columns to display on the output report. That is, these checkboxes control the columns on the output report. If a user wishes to see both Total Material and Total Engineered Furnished and Installed categories in the report, these check boxes must be selected. To assist in some higher-level analyses, the first three options serve as group-by's. If the Cost Calc ID, CLLI (Common Location Language Identifier), and/or Service are selected, the report output will be grouped by these categories.

After these options are specified, the user can select the "Run Report" button to generate output. Or, if desired, the "Create Cost Calc Feed" button can be selected. Pressing this button will generate output files for all Rservices with the "User for Cost Calc Feed" check box selected.

SECTION 10

COMPARISON TO OTHER MODELS

Q. HOW DOES THE BSTLM© COMPARE TO OTHER MODELS?

A. As I noted earlier, BSTLM© represents the "next generation" loop model. It was designed to include the best features of all the models and includes new approaches that have addressed some of the past model deficiencies. In addition, it is based on more actual data that any model to date. Finally, it recognizes all of the services and UNEs provided by BellSouth. This recognition occurs in the proper engineering, the services dispersion, and the capturing of the resulting costs.

Q. THE DOCUMENTATION HAS A TABLE THAT COMPARES THE MODEL TO OTHER MODELS, IS THERE AN ADDITIONAL COMPARISON AVAILABLE?

A. Yes, I was recently at a Tennessee proceeding where a representative of AT&T presented a table summarizing the existing models available at the time. I have taken this summary and added a summary of the BSTLM© (my additions are shaded). This table is attached to my testimony as exhibit JWS-5. As you can see in the attached table, based on the key items listed by AT&T, the BSTLM© compares favorably to the other models.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

REVISED DIRECT TESTIMONY OF MR. JAMES W. STEGEMAN

ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 990649-TP

(PHASE II)

August 18, 2000

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS AFFILIATION.

A. My name is James W. Stegeman. I am the President of CostQuest Associates, Inc. I am testifying on behalf of BellSouth Telecommunications ("BellSouth", "BST" or the "Company").

Q. ARE YOU THE SAME JAMES STEGEMAN WHO FILED DIRECT TESTIMONY IN THIS PROCEEDING ON MAY 1, 2000?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REVISED DIRECT REBUTTAL TESTIMONY?

A. I will cover the changes to the BellSouth Telecommunications Loop Model or the BSTLM as filed on August 16th, 2000.

Q. BELLSOUTH RECENTLY MADE AN UPDATED FILING IN THIS PROCEEDING ON AUGUST 16, 2000. WHAT WAS THE PURPOSE FOR UPDAING BSTLM?

A. The reasons for updating BSTLM were twofold. The first was to correct flaws in the model discovered after the first filing. The second reason was to introduce additional functions and features to enhance the model, many at the suggestion of AT&T. While we do not anticipate any additional filings in this proceeding, BellSouth is continually reviewing the model to ensure its correctness and to introduce new concepts, features, and functions. Please realize that cost modeling is not a stagnant process.

Q. CAN YOU OVERVIEW THE ERRORS THAT WERE CORRECTED FROM THE PRIOR VERSION OF THE BSTLM (VERSION 1.2)?

A. Yes, the following is an overview of the errors addressed in the latest release of BSTLM.

<u>GIS Pre-processing</u>

- Revised road preparation process to exclude specific road types that customers do not live on and routing does not follow, for example Highways and highway access ramps.

<u>Investment Logic</u>

- Revised material calculations for structure capacity costs. Version1.2 was incorrectly developing capacity costs.
- Updated Excel shutdown routine. In a Windows 98/Excel97 environment, Version1.2 may shutdown after a number of wire centers are run through the Process Wizard.
- Fixed 812C issue. In Version1.2, this fiber Field Reporting Code (FRC) appeared on a number of copper-only reports.
- Fixed Building Cable Sheet in investment logic. In Version1.2,
    - If Feeder Distribution Interface (FDI) Max size was exceeded, no FDIs were put in; and,
    - If EquipQty field was greater than 1, only 1 DTBT was placed in a building but sized as if multiple units were put in. Corrected to always place multiple DTBTs in a building.

Reporting Process

- Fixed Rservice reporting NULL error. Version1.2 would produce an error if a report was chosen that had no supporting report data in the scenario.
- Modified report.mdb. Length FieldSize property modified to be double from long integer. Prevents Null value in Copper-Only scenario when field overflows. This was not causing an error in Florida but it was causing an error in other states.

User Interface

- Fixed function to send single user input table to Excel. In Version 1.2, this function was not working.

Configuration Process

- Modified DTBT EquipQty calculation - added DTBTFill to the lines requirement calculation. Version1.2 was not including any fill in determining proper equipment size.

System Tables

- In SytemDB, Modified tblInputObjects; Table 4 was missing. Did not output DTBT input values to Excel Logic. Version1.2 was ignoring user inputs for DTBT material prices. Instead, the model was developing the DTBT material prices from the Indoor FDI primitives.
- In SystemDB, Modified tblFields; Needed to add Excel Sort order for Table 4 so that system would output to Excel Logic. This was also associated with the problem of DTBT inputs not being used in Version1.2

Q. CAN YOU OVERVIEW THE ENHANCEMENTS TO THE BSTLM MADE SINCE THE PRIOR VERSION (VERSION 1.2)?

A. Yes, the following is an overview of the enhancements added in the latest release of BSTLM.

User Interface

- Added feature to track user-initiated input changes. For each scenario with processed wire centers, BSTLM tracks any input changes. When a change is made and the edit inputs session is terminated, BSTLM prompts the user with an informational message. The user has two choices. If the user selects the

RESET button, the changes are accepted AND all wire centers in the scenario are reset in status back to the appropriate process. If the user selects the CANCEL button, ALL changes are removed and the scenario remains in the same state as prior to editing.

  - For example, if a user changes the price for 12 pair 24-gauge cable and exits the edit inputs form, they are prompted with two options. They can either RESET all inputs and begin processing at the INVESTMENT process or they cancel the input changes. If they elect to RESET, all wire centers will show as requiring a re-process from the investment process forward. If they CANCEL, all input changes are removed. If a user selects RESET, the changes cannot be undone.

- Process logging has been enhanced to show tables changed, system component versions and reporting errors. Report errors are shown when, for example, a user runs an Rservice report in a region without a specific service or element. These instances are reported as warnings within the Process Wizard form as well as written to the BSTLM.log.
- System Statistics that list out their versions of the components in the system are now available from the system menu.
- The Process Wizard was modified. The Process Wizard now allows a user to specify and run both Rservice reports and Cost Calculator Feed. The Cost Calculator feed will create Cost Calculator reports for all Rservices so designated. Format is specified within the Wizard. Rservice definition and columns to be reported are specified within the new wizard.

- Added ability to accommodate decimal value pair and DS0 equivalence values in Service Description Table. Pairs per house rule also now accommodates decimal values.
- Added ability to create new Scenarios from any other scenario. The user is prompted to provide the source scenario. The user also has the option to copy a scenarios processed IDB files.
- Added ability to create multiple wire center Audit files. User is now prompted to select which wire centers and which Audit files top create in one single step.
- Moved AllLocalChannelsToFO rule from options screen to Network Rules. The default value is Yes.
- All structure tables and associated groups are now visible and available for user input. Structure inputs were not visible in Version1.2.

GIS Process

- Added capability to route drop from lot corner in addition to standard rectilinear method. This upgrade requires two new GIS rules. UseRectilinearDrop, Yes/No. Yes maintains rectilinear drop, no forces corner drop routing. Non-rectilinear drop routing uses the lot width value specified in second new rule MaxLotWidth. This requires an integer intended to model the maximum width for a lot.
- Removed the distance 5% design extension for both CSA and AA placement. Hard and design limits are not modified from inputs shown. Hard limit and soft limit can now be set equal.

Documentation

- Updated BSTLM Model Methodology to include more detail on MSRT algorithm, CSA/AA design and network element placement. Included discussion of structure and methods used to generate structure cost
- Updated User Guide to correspond to newly filed release. Added a description for removing password from protected files.
- Updated Online Help to correspond to latest release.

Summary Process

- Enhanced Summary process to reduce memory requirements. Processing and reporting time significantly reduced. The need to split Florida into two separate runs was eliminated.

Key Statistics Reporting

- Implemented Key Statistics reporting capability. User can now report out statistics on route mileage, equipment quantities, and customer counts.

Reporting

- Added a TELRIC/TSLRIC switch to the cost calculator process.
- Exclude Node Service Count field in reports created by a Public user.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

REBUTTAL TESTIMONY OF MR. JAMES W. STEGEMAN

ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 990649-TP

(PHASE II)

August 21, 2000

INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS AFFILIATION.

A. My name is James W. Stegeman. I am the President of CostQuest Associates, Inc. I am testifying on behalf of BellSouth Telecommunications ("BellSouth", "BST" or the "Company").

Q. ARE YOU THE SAME JAMES STEGEMAN WHO FILED DIRECT TESTIMONY IN THIS PROCEEDING ON MAY 1, 2000?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. In my rebuttal testimony, I address BSTLM issues raised in the rebuttal testimony of John C. Donovan and Brian F. Pitkin, on behalf of AT&T Communications of the Southern States, Inc. ("AT&T") and MCI WorldCom, Inc. ("MCI").

Also, for the reader's convenience, I have provided a list of acronyms used as an attachment to my testimony as Exhibit JWS-1.

Q. BELLSOUTH RECENTLY MADE AN UPDATED FILING OF BSTLM IN THIS PROCEEDING ON AUGUST 16, 2000. DOES THIS NEW VERSION OF THE BSTLM ADDRESS SOME OF THE ISSUES RAISED BY MR. DONOVAN AND MR. PITKIN?

A. Yes. Mr. Donovan and Mr. Pitkin raise several issues concerning the speed of BSTLM, structure costs in the model, and drop routing.

BellSouth has addressed their concerns as follows:

Speed:

On pages 6 and 8, Mr. Donovan and Mr. Pitkin make mention of the fact that BSTLM requires a significant amount of time to process the state of Florida. We are aware of the speed issue and are constantly looking for ways to increase the granularity and accuracy of reported information while decreasing the model's run time and improving the response time of reporting. The new version of BSTLM has made major strides in this area. First, the new version's summary process has been reengineered so that the state of Florida can be processed in ONE run. This eliminates 3 of 6 runs that need to be processed. Second, the processing time for Florida has been reduced so that the entire state can now be run in well under 24 hours (machine dependent). Third, the reports from the system can now be obtained in a fraction of the time needed in Version 1.2.

Fourth, the process wizard has been improved to allow the user to set up all processing, all reports, and all CostCalculator files in one step. Finally, the interaction of the system with Excel has been modified to reduce the possibility of system shutdown that has been noted on a few machines.

Structure:

On page 30, Mr. Donovan and Mr. Pitkin state that they are prevented from developing structure costs within the BSTLM. In the original filing, the structure tables were hidden and the associated documentation was omitted. This was due to the fact that BellSouth applies in-plant factors in the CostCalculator to the material investment generated by BSTLM rather than using BSTLM to produce the structure costs. In recognition of the fact that other parties may want to have BSTLM produce the structure costs, the new version of BSTLM has all structure input tables turned on and the associated documentation added into the BSTLM Methodology Manual.

Drop Routing:

On pages 42 and 43, Mr. Donovan and Mr. Pitkin take issue with how the model routes the drop. They recommend that the drop be run from the corner of a lot at an angle to the geocoded customer position rather than the rectilinear approach used in Version 1.2 of BSTLM. In the new version of BSTLM, the user is now able to select the method used to route the drop. By selecting the appropriate value for the input, the drop is either run rectilinearly or at an angle from the corner of the lot[1]. BellSouth chose to use the angled drop approach in the August 16th, 2000 filing.

[1] The maximum lot width must be specified as a new GIS Rule.

However, the impact of this change for Florida is not the 21.7 percent change postulated by Mr. Donovan and Mr. Pitkin. Their analysis is based on a DTBT being placed at a lot corner. In this situation, the angled drop change compared to the rectilinear distance will result in the highest percentage change compared to any other DTBT placements that may actually occur in the model. In reality, the model's approach to DTBT placements results in some DTs being placed directly in front of a customers location or some DTs being placed so that the drop route first must run in front of other customer lots. For these non-lot corner placed DTBTs, the percentage change will be less than what Mr. Donovan and Mr. Pitkin demonstrate. In fact, the realized impact of the drop routing change is minimal as it only changes costs by less than a penny a month.

Q. ON PAGE 7, MR. DONOVAN AND MR. PITKIN STATE THAT THE INABILITY TO PRODUCE MAPS LIKE THOSE IN MY DIRECT TESTIMONY IS A DISADVANTAGE IN REVIEWING BSTLM. CAN YOU COMMENT?

A. BellSouth has provided to AT&T/MCI the MapInfo tables used to develop the charts presented in my direct testimony. These tables allow AT&T and MCI to not only produce the maps I used, but also lets AT&T and MCI view the results of the model for the entire wire center. In addition to these mapping tables, BSTLM has a "Tree" viewing capability. This auditing function allows the user to graphically depict the modeled network. While this is not as "pretty" as the MapInfo picture, it is a useful tool in understanding the network that has been designed. Further, the Audit Tree view is dynamic, allowing a user to review Node information such as equipment size, quantity and capacity demanded. This information can even be translated to the investment logic

allowing an interested party to determine the BSTLM investment for a specific element within the modeled network.

Q. MR. DONOVAN AND MR. PITKIN RECOMMEND THAT "WORKAROUND" TECHNIQUES BE USED TO CORRECT PERCEIVED SHORTCOMINGS IN BSTLM. SPECIFICALLY THEY MENTION THE DLC VENDOR SELECTION AND THE APPORTIONMENT OF FIBER AND DLC COSTS. SHOULD THE "WORKAROUNDS" PROPOSED BY MR. DONOVAN AND MR. PITKIN BE IMPLEMENTED?

A. No. First, I believe the new version of the model produces accurate estimates of material costs for BellSouth UNE purposes. Second, I am concerned that some of the changes Mr. Donovan and Mr. Pitkin recommend would introduce more bias than exists in the claimed deficiencies that they are trying to correct. Let me cover the two items discussed by Mr. Donovan and Mr. Pitkin.

DLC Vendor Selection:

- While this is partially an input issue that is covered by Daonne Caldwell, it is also a BSTLM modeling issue. The current DLC costing approach in BSTLM uses a melded cost at each DLC location. While this approach does not reflect the reality that a single vendor is typically used at each location, it does represent the true proportion of vendor equipment installed in the state of Florida.
- Mr. Donovan's and Mr. Pitkin's proposed approach, on the other hand, may be too simplistic and does not reflect the real proportion of vendor equipment

installed in Florida by BST, nor the engineering rationale beyond cost. Their approach ignores the fact that DLC vendor selection is not only a function of material cost, but also a function of installation costs, maintenance costs, and efficient deployment criteria. In addition to the problem of using a single vendor, the analysis of the two vendors' total DLC cost in Exhibit JCD/BFP 9 simplistically assumes that all DLC installations use 100% POTS cards and ignores the fact that there are many instances of Indoor DLC systems.

Allocation of Fixed costs

- I agree that any allocation of shared costs should be competitively neutral and fair, but it should also produce unbiased results. The DS0 approach to apportioning the Fiber and portions of the DLC is reasonable and no more "arbitrary" than the use of Service counts or copper pair counts. Indeed, it appears that Mr. Donovan and Mr. Pitkin agree that DS0 capacity is a valid approach to use to size the DLC systems. This seems to indicate that there is some cost causality between DS0 and required DLC equipment. Such cost causality indicates merit to apportioning costs by DS0s.
- However, even assuming that service counts or pair counts were an appropriate allocation method, Mr. Donovan's and Mr. Pitkin's workaround is still unacceptable, particularly since they recognize (page 39) that their approach may underbuild the network. This introduction of a bias should be a major cause of concern.

To test their approach and determine if a true bias is introduced, I performed a comparison run of the new BSTLM (BST2000 scenario). One run was made

using the model as filed on August 16, 2000. A second run was made using Mr. Donovan's and Mr. Pitkin's proposed DS0 equivalents contained in Exhibit JCD/BFD 10. As correctly assumed by Mr. Donovan and Mr. Pitkin on page 39, the use of their proposed workaround did in fact underbuild the Florida network by almost 3%. It should also be noted that the services listed by Mr. Donovan and Mr. Pitkin in Exhibit JCD/BFD 10 represent less than 1% of the services provisioned off of fiber fed DLC systems.

An underbuilding of the network by 3% seems an unreasonable bias for dealing with services that represent less than 1% of the services provisioned out of fiber fed DLC systems. Therefore, I would recommend that it is best to continue with the current BSTLM's use of DS0s to apportion the costs of Fiber and portions of the DLC equipment. The DS0 approach is fair, neutral, unbiased, and is supported by some amount of cost causality.

Q. MR. DONOVAN AND MR. PITKIN CONTEND THAT THE FACT THAT SOURCE CODE HAS NOT BEEN OPENED UP FOR MODIFICATION MAKES THIS SYSTEM UNREVIEWABLE AND HAVE CALLED IT A "PROTOTYPE" SYSTEM. DO YOU AGREE?

A. No. It is true that the source code has not been released in electronic format for other parties to modify. However, we have released the code in a document that parties could review and have been willing to entertain and implement suggested changes from other parties based upon such review. Finally, I would not characterize the model as a prototype. A prototype is typically a proof of concept model that is used in the

development of portions of complex models. This model is a complete platform that has been tested, verified, and shown to work.

Q. MR. DONOVAN AND MR. PITKIN STATE ON PAGE 35 THAT "BECAUSE IT IS SERVICE ORIENTED, RATHER THAN ELEMENT ORIENTED, THE BSTLM MUST ALLOCATE THE SHARED EQUIPMENT INVESTMENT TO THE INDIVIDUAL SERVICES THAT USE THE EQUIPMENT". IS THIS CORRECT?

A. It is not clear what Mr. Donovan and Mr. Pitkin mean by this statement. Nor is BellSouth clear as to any real implications this has for estimating costs. BSTLM is a model that builds a network to services purchased by customers. BSTLM does look at services and their impact on the network that needs to be constructed. In this regard, BSTLM is different from proxy models that Mr. Donovan and Mr. Pitkin have previously endorsed. The proxy models simplified the complex task of building a network to serve the multitude of services that are actually demanded. However, I am not sure how the BSTLM's approach would impact the allocation and definition of what is a shared facility. If in the end, we are looking at a forward-looking approach to costs, BSTLM simply builds up the costs of elements used by each service, which is the approach used by proxy models elsewhere.

Q. MR. DONOVAN AND MR. PITKIN MAKE COMPARISONS OF THIS MODEL TO THE BCPM AND HAI TO SUPPORT THE RATIONALE FOR THEIR MUCH LOWER RESULTING UNE COSTS. IS THIS A VALID COMPARISON?

A. No. I recommend that Mr. Donovan's and Mr. Pitkin's comparison to the HAI and BCPM and their resulting conclusions be dismissed, since there are a number of issues that make their comparison of BSTLM to these proxy models invalid. First, the BCPM and HAI were designed as universal service models. In fact, the BCPM was never touted as a UNE model, contrary to the statement of Mr. Donovan and Mr. Pitkin on page 23 that "BCPM...estimates ...cost of providing UNEs". This is important in that a universal service model is based on a different set of assumptions. The most important of which is that the model reflect the cost of the most efficient potential provider in an area based upon publicly available inputs. By comparison, a UNE model is typically based upon as much actual data that represents the costs the incumbent carrier is expected to incur in providing service on a going forward basis. While the UNE and USF approaches may be similar, they can lead to differences in modeling and results. Second, the BCPM and HAI relied upon public sources of customers, wire centers, and inputs that do not reflect the actual network, practices, customers, and wire centers of BellSouth. Third, the networks built are based upon different engineering inputs, guidelines, and modeling approaches. For example, both the BCPM and HAI build to an abstraction of where customers may be. The BSTLM builds to the roads customers live on. In addition, the BCPM was based upon a maximum DLC size of approximately 1344 lines while the BSTLM uses a maximum design size of 2016.

In addition, in their use of route distances, Mr. Donovan and Mr. Pitkin have compared apples to oranges. The BCPM and HAI do not break out the shared routing of Feeder and Distribution. Therefore, if 5 miles, for example, of route were shared between a distribution and feeder route, the BCPM and HAI would have reported this in both the distribution and feeder distances. On the other hand, the way the BSTLM route mileage

is reported by Mr. Donovan and Mr. Pitkin, this distance shows up in NEITHER the distribution nor feeder. Rather, it shows up as a shared route. If we restated Exhibit JCD/BFP 3 to reflect these differences, it would show the following:

Equipment Type	BCPM	BSTLM	HAI
Distribution Route Miles	44,504	43,063	47,751
Feeder Route Miles	17,466	7,853	10,819
Total	61,970	50,916	58,570

From this restated table, we can see that the differences are not as great as represented by Mr. Donovan and Mr. Pitkin. As a final point, the models design the network differently. Customers are neatly laid out in the BCPM and HAI with drop conveniently running from the corner of a lot. The BSTLM places the distribution terminals more realistically to serve actual customer locations. This may mean that the models may define portions of the route as feeder, distribution or drop differently. When one considers that the BSTLM places over 50,000 miles of drop cable in addition to the route mileage of distribution and feeder, the classification of the route distance as either drop, distribution, or feeder could have a dramatic influence on any potential comparisons between the models.

Q. MR. DONOVAN AND MR. PITKIN MAKE NUMEROUS REFERENCES TO BSTLM'S USE OF COST OPTIMIZATION. DOES THE MODEL OPTIMIZE ROUTE COST OR ROUTE DISTANCE?

A. The BSTLM minimizes total network component placements (DTBTs, DLCs) while minimizing the route distance in between the components using the Minimum Spanning Road Tree (MSRT). We believe that this approach will result in minimized cost. However, the model does not minimize costs directly in the optimization. Part of the confusion stems from the fact that there was unused variable in the model left from our true "Prototyping". This variable "MinimizeTotDistFDICost" is not used in the model. In the latest release, this variable has been removed from the inputs to eliminate any confusion.

Q. ON PAGES 40-42 OF THEIR REBUTTAL, MR. DONOVAN AND MR. PITKIN CLAIM THAT THE MODEL'S MSRT APPROACH MAY OVERSTATE THE NETWORK FACILITIES. IS THIS TRUE?

A. No. In part, these claims may stem from the fact that the original documentation on the MSRT was not clear. This section of the documentation has been rewritten as part of the August 16th, 2000 filing to provide a clearer overview of how the model constructs both the feeder and distribution routes. We believe that the following explanation and the improved documentation should clear up AT&T's and MCI's purported issue. In fact, as explained below, the BSTLM's route distance is the minimum realistic route distance needed to connect the distribution terminals within a CSA.

BSTLM Usage of the MSRT for Cable Routing

The BSTLM uses the Minimum Spanning Road Tree (MSRT) to efficiently route cable to the network elements of a wire center. This overview introduces an

important property of the MSRT and how that property is used to produce optimal cable routes for both Allocation Areas (AAs) and Carrier Serving Areas (CSAs).

The MSRT is analogous to the classic Minimum Spanning Tree (MST) with the exception that points must be connected using road segments. The points of the MSRT are optimally connected using the shortest length set of road-based paths. The strategy for each step of the MSRT algorithm is to connect the point that is closest to the *current* tree via a path along roads.

This strategy requires that a point be specified as the starting point, or *source node*, for the algorithm. When the BSTLM builds the MSRT for AA generation and the "big" MSRT for CSA generation, the source node is the location of the switch. The points that the algorithm connects to the switch are the Distribution Terminal (DT) locations established in an earlier process. It is important to note that the location of the source node plays a significant part in the resulting configuration of an MSRT. Using the algorithm to connect the same set of points to two different source nodes may produce two different MSRTs. The important aspect of this is that the points are optimally connected as a whole to the source node.

Every point in the MSRT has a path in the tree that can be followed back to the source node. A point's source path may course through other points in the MSRT. If the source path for point B goes through point A, then both points share the same path back to the source *starting* at point A. This produces a relationship between the two points:

- point B is *downline* from A, or *further* from the source following MSRT paths

or conversely,

- point A is *upline* from B, or *closer* to the source following MSRT paths

There is an important property regarding the MSRT paths of points that are downline from another point. The sub-tree defined by paths of all downline points back to a common upline point is also an MSRT, having that common upline point as the source node. For example, points A, B and C are three of many points in an MSRT. If points B and C are downline from point A, then the paths from B and C back to A define a sub-tree that is the MSRT of A, B and C using A as the source node. The BSTLM takes advantage of this property during AA and CSA generation.

The BSTLM generates AAs by constructing the MSRT connecting all DTs that are close enough to the switch to be handled by copper alone (based on the user input for the design limit). The switch is used as the source node for building the MSRT. The model generates an AA by looking for a point in the original MSRT where the service demand of all downline DTs is close to but does not exceed the design limits for an AA. This point becomes the Allocation Area Node (AAN), a common node in the distribution network of an AA. The MSRT that connects the DTs to the AAN would define optimal cable routes for the AA. Since the DTs of the AA are all downline from the AAN, the sub-tree of paths from the original MSRT back to the AAN *is* the MSRT for the AA. Generating AAs with optimal cable routes is as simple as splitting up the original MSRT into AA-sized sub-trees.

Generating CSAs is almost as simple as generating AAs. The first step is to construct the MSRT connecting every DT in the wire center that did not get included in an AA. Once again, the switch is used as the source node for building the MSRT. To generate a CSA, the model starts with the DT that is furthest downline. The model follows this initial DT's path back to the switch until it finds the last point *X* where:

i. the service demand of all DTs downline from point *X* is not greater than the service capacity of a Digital Loop Carrier (DLC)
ii. the number of extenders downline is not greater than a specified limit, where extenders are the customers of DTs with MSRT paths to point *X* that are longer than the design limit for copper distribution
iii. there are no DTs downline with MSRT paths to point *X* that are longer than the hard limit for copper distribution

All DTs downline from *X* become members of the CSA. Point *X* is the furthest upline the DLC may be placed to serve these downline DTs. The service demand of the downline DTs is often lower than the capacity of a DLC. Therefore, the model looks upline from *X* for more DTs that may be included in the CSA. Upline DTs are added to the CSA as long as their MSRT paths to *X* do not exceed the design limit for copper *and* they do not add more service demands to the CSA than can be handled by the DLC. The DLC is then optimally placed along the path of the MSRT to the initial DT, but no further upline than point *X*.

The original MSRT paths for all DTs *downline* from the DLC define a sub-tree that is the MSRT for those DTs using the DLC as the source node. Therefore, the original MSRT paths for downline DTs are used as the optimal cable paths for the CSA. However, the MSRT paths of DTs *upline* may not be optimal with respect to the DLC location (new source node). The model recognizes this and rebuilds the MSRT of CSAs to upline DTs using the DLC location as the source node.

Q. **MR. DONOVAN AND MR. PITKIN PROPOSE CERTAIN INPUT CHANGES TO BSTLM (EXHIBIT JCD/BFP-10). DO ANY OF THE PROPOSED CHANGES LEAD TO THE EXCLUSION OF RELEVANT INVESTMENTS?**

A. Yes. While Daonne Caldwell will cover the value of the inputs used by Mr. Donovan and Mr. Pitkin, there are several material input changes proposed by Mr. Donovan and Mr. Pitkin that would result in the omission of material costs for modeled equipment. These appear to be the result of model misunderstandings or input errors. The troublesome input changes are as follows:

- It appears that FDIs of sizes 4800, 5400, and 7200 have had their material inputs levels effectively set to 0. Exhibit JCD/BFP-10, pages 3 and 4, list the new inputs as "#DIV/0!". This value would be treated the same as a 0 input level in the model.
- It appears that a fiber cable size of 6 has had its material investment level effectively set to 0. Exhibit JCD/BFP-10, pages 4 and 5, list the new inputs as "#DIV/0!". This value would be treated the same as a 0 input level in the model.

- It appears that all indoor FDI costs have been zeroed out. Exhibit JCD/BFP-10, page 6, list all of the FDI primitive inputs as "-" or "0". These primitives are used to develop the cost of the Indoor FDI equipment.
    - This change also has an impact on DTBT material levels. Due to an error in the previous version of BSTLM, the user-provided DTBT investment levels did not flow to the Investment determination in the model. Instead, the model relied on the FDI primitives to build up the costs of the various DTBT sizes. This did not cause major problems in the BellSouth initial filing results since the actual DTBT inputs were derived in the same manner. However, since the new FDI primitives recommended by Mr. Donovan and Mr. Pitkin appear to be 0, the DTBT investments resulting from their model run would be close to, if not, 0.
- It appears that the HDSL Modem and NIU material levels do not have material amounts represented. Based on the notes in Exhibit JCD/BFP-10, pages 6, the input of 17.04 represents only labor costs.

Q. MR. DONOVAN AND MR. PITKIN RECOMMEND THE USE OF BCPM INPUT VALUES FOR CABLE, FDIs, AND SOME OTHER ITEMS APPROVED BY THIS COMMISSION IN DOCKET NO. 980696-TP FOR USE IN BSTLM FOR THIS PROCEEDING. PLEASE COMMENT ON THIS APPROACH BASED ON YOUR EXPERIENCE WITH BOTH MODELS.

A. On page 31, Mr. Donovan and Mr. Pitkin recommend the use of BCPM inputs approved by the Commission in Docket No. 980696-TP. However, it is interesting that they chose only certain input values and failed to use other of the Commission approved input

values. As I mentioned previously, the BCPM was designed as a universal service model. Inputs were argued from the standpoint of developing the engineering practices and resulting costs of the most efficient provider in Florida. As such, numerous inputs developed and approved in Docket 980696-TP did not and still do not represent BellSouth in Florida. In addition, directly transferring inputs from a universal service cost model (BCPM) to an unbundled network element model (BSTLM), without consideration of the basis for the inputs, their inter-relationships and the engineering practices reflected by each unique model, should be avoided unless it is done carefully and thoughtfully with a realization of what the outputs are applicable to. This is particularly true since BSTLM was not designed to be directly compatible with the BCPM and both models were designed with a different set of assumptions. As noted by Daonne Caldwell, the best set of inputs for BSTLM in this proceeding are those that represent the most up to date values for BellSouth's engineering practices, technology choices, and actual material and installation costs.

However, even if one were to use the inputs from Docket No. 980696-TP, they need to be used in whole and ideally brought up to date. First, one must consider that the BCPM inputs advocated by Mr. Donovan and Mr. Pitkin are more than 2 years old. Second, one must also consider that Docket No. 980696-TP was considered and decided in whole. If the inputs are used in this proceeding, the BSTLM inputs should mirror as close as possible all approved inputs to the BCPM. This includes engineering rules, material inputs, and contractor costs. To use only piece parts of the inputs would be incorrect without fully reviewing each input and its inter-relationships with other input values. For example, in Mr. Donovan's and Mr. Pitkin's Exhibit JCD/BFP-10, it appears that there has been no input of the trenching cost associated with the BCPM cable inputs.

These BCPM trenching costs represent a very significant cost of the network and could lead to a large understatement of the resulting UNE costs.

Q. WAS BELLSOUTH ABLE TO CONVERT OVER THE BCPM INPUT VALUES APPROVED IN DOCKET NO. 980696-TP?

A. Yes. BellSouth made its best efforts of converting all of the inputs approved in Docket No. 980696-TP to the BSTLM. In certain instances where BCPM inputs were not available or too difficult to translate (DLC and SONET), BellSouth left BSTLM inputs as is. For engineering rule decisions, BellSouth made BSTLM mimic these rules as best as possible for this analysis. A complete set of changes between BellSouth's BST2000-Fl-Ref scenario and this new "BCPM" scenario is listed in Exhibit JWS-2. Please note that no attempt was made to bring these values up to date.

Q. WHAT ARE THE RESULTS OF THIS "BCPM" RUN IN COMPARISON TO BELLSOUTH'S AUGUST 16th, 2000 FILING AND MR. DONOVAN'S AND MR. PITKIN'S RESULTS?

A. After carefully setting BSTLM inputs to values mimicking BCPM inputs, a run was made and compared to the August 16th, 2000 filed results. As one can see from the table below, when considering the inputs of Docket No. 980696-TP as a whole in BSTLM, the results filed on August 16th, 2000 are very reasonable. The new "BCPM" results do bring into question the results of Mr. Donovan and Mr. Pitkin.

Run	Average Loop Investment	Average Monthly Cost
August 16th, 2000	$852	$18.04
Donovan/Pitkin	436[2]	7.42
BSTLM with BCPM loop inputs	832	16.81

Q. GIVEN MR. DONOVAN'S AND MR. PITKIN'S RESULTS AND THE RESULTS YOU PRESENT, HOW CAN THIS COMMISSION BE ASSURED AS TO WHICH RESULTS ARE REASONABLE?

A. I understand the great difference in numbers between Mr. Donovan's and Mr. Pitkin's and BellSouth's results may raise a few questions. However, it appears that BellSouth's August 16th, 2000 filed results are reasonable when compared with the results of BSTLM run with a complete set of the inputs adopted in Docket No. 980696-TP. In addition to this comparison above, BellSouth compared the total network investment developed by the filed BSTLM and Mr. Donovan's and Mr. Pitkin's BSTLM results against what is on BellSouth's books in Florida. While I recognize that the BSTLM is a forward-looking model, the booked investments can serve as a "sanity check" for the BSTLM filed results. As one can see from the table below, BellSouth's results filed on August 16th, 2000 and those results of BSTLM run with a complete set of BCPM inputs appear fairly reasonable to the booked amount. However, it seems unlikely that Mr. Donovan's and Mr. Pitkin's resulting investments are plausible. While I realize that the booked amount

[2] This value was estimated using Mr. Donovan's and Mr. Pitkin's inputs in the August 16th, 2000 version of the BSTLM. The BSTLM value was then converted to investment by using the BellSouth CostCalculator that was populated with BST inputs. As such, this estimate represents an upper bound of the actual Mr. Donovan and Mr. Pitkin value.

of plant presented is not made up of the local loop only, I would surmise that 75-85% of this plant is local loop. I am also aware that the material investment in A.1.1 is not 100% of the local loop. However, over 93% of the investment generated by BSTLM is represented by A.1.1.

	Total Plant in Circuit, Poles, Aerial Fiber and Copper, Intrabuilding Fiber and Copper, Underground Fiber and Copper, Buried Fiber and Copper, and Conduit.
Booked Amount Year End 1998	$7,147 million
August 16th, 2000	$5,189 million
Donovan/Pitkin	$2,639 million[3]
BSTLM with BCPM loop inputs	$5,034 million

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes it does.

[3] This value was estimated using Mr. Donovan's and Mr. Pitkin's inputs in the August 16th, 2000 version of the BSTLM. The BSTLM value was then converted to investment by using the BellSouth CostCalculator that was populated with BST inputs. As such, this estimate represents an upper bound of the actual Mr. Donovan and Mr. Pitkin value.

BY MR. ROSS:

Q Mr. Stegeman, do you have a summary of your testimony?

A Yes, I do.

Q Can you please give it at this time.

A Yes. Good afternoon. I want to take this opportunity to thank you for allowing me to discuss the issues surrounding the BSTLM. First and foremost, I would like it state that in my opinion the BSTLM is the most accurate loop modeling platform for estimating the forward-looking cost of deaveraged UNEs, loops, and related elements.

This seems to be somewhat supported by AT&T in their statement that the BSTLM constructs a reasonable estimation of the local telephone network and the fact that a second model was not introduced into this proceeding.

The BSTLM is, as I have stated, next generation loop model. The BSTLM uses more actual BellSouth data than any proxy model preceding it. It uses the actual customer locations and services provisioned to each location, the BellSouth wire center locations, the BellSouth wire center boundaries, the roads within BellSouth's territory, the engineering parameters currently in use by BellSouth, and up-to-date BellSouth

material inputs. BSTLM is the product of a natural evolution and the cost proxy models that have preceded it beginning with the FCC's search for a model in determining universal service subsidies.

BSTLM is state of the art in terms of bottom-to-top modeling and incorporate features similar to both the cost proxy model and a company-specific incremental engineering cost model. Through the use of spreadsheets, data bases, and a user friendly interface, BSTLM allows a user to determine the loop investment required to supply a wide range of services within BellSouth's Florida territory. These services range from narrow band POTS services to wide band VS-1 loops.

At its core, BSTLM is a spacial model in that it determines where customers are located and lays cable along the roads of each wire center. In fact, a cable path can literally be traced from each customer's premise back to its serving central office. A path that follows the actual roads in a wire center.

Serving areas are determined for a wire center based on its minimum spanning road tree, or what we call an MSRT. Simply, the MSRT is the shortest path that connects customer locations. Once an MSRT is determined for these customers in excess of a user-defined road distance from the central office, branches of the tree are

broken off to form what we call carrier serving areas, or CSAs.

Appropriate components, such as digital loop carriers and feeder distribution interfaces, what we call FDIs, are then located within each serving wire center. The MSRT within each wire center using the DLC as the source node, not the switch, is then used to estimate the distribution cable path. An MSRT for feeder plant is also determined that links the DLCs in the allocation areas back to the central office.

Once the spacial layout of the network is determined, BSTLM determines the efficient cable size and equipment sizes and then calculates the dollar investment associated with each component of the network.

However, the BSTLM is not a perfect representation of what the actual network looks like. As pointed out in Daonne Caldwell's material, the BSTLM has a propensity to install smaller cables than may actually be placed in the field. This arises from the fact that the model is aggressive in its tapering. That is to say, the model does not incorporate the cost of tapering in determining whether tapering is cost-effective at a point.

Further, with total knowledge of the current demand, the model does not recognize how an actual network evolved. Rather, it builds the network as if it were all

laid out at once today.

Finally, the model may be too optimal in its routing approach. The model assumes the engineers have no other constraint in laying out the network other than the route links of all points. Instead, an engineer must take into account actual rights-of-way, future growth patterns, existing structure, and many other factors. As this case has unfolded, a number of issues have arisen in regards to the BSTLM.

It is important to realize that this is a model that abstracts BellSouth Florida's real network, and that cost modeling by its very nature is an evolutionary process. Some of this evolution has occurred in this case. AT&T recommended numerous changes to the model. While we were not able to incorporate all of these requested changes, we were able to incorporate most of the requested changes in the time frame provided.

Let me review some of the loop modeling issues that still exist on the drop. We incorporated the changes requested by AT&T, specifically have modified the BSTLM so that it routes the drop at an angle from the corner of a lot. In the original model the drop was run rectilinearly.

AT&T and MCI contend that a drop terminal should always be placed at a corner, though. While I recognize

that drop terminals can be placed at the lot corner, we implemented a fix that produced the minimal drop distance. If a drop terminal is always placed at a corner as recommended by AT&T and MCI, I am fairly certain that the resulting lengths and costs would increase. To contend that our conservative approach is invalid and instead use a hard coded 22 percent reduction as recommended by AT&T and MCI is ridiculous.

On the issue of DLC vendor selection, the BSTLM model is a complete Vendor A and Vendor B at each DLC site. The model then estimates the cost of the site based upon the statewide melding percentage. This does not mean that the equipment is mixed, rather it estimates what the average costs are at any site in Florida given the statewide characteristics of DLC equipment and placement. By assuming this constant mix, the rings are also consistent.

The requested change from AT&T of modeling an entire ring with one vendor or another based on the cost is not an easy modeling change. This is the main reason that the modification has not been completed for this proceeding. We were not gambling. To follow correct engineering practices, each DLC on a single ring must have the same vendor.

To implement this change we will need to look at

each node of the DLC ring, determine the cost using Vendor A, then Vendor B, and then determine which vendor produces the least cost for that entire ring and then select the vendor.

While easily explained here, the programming changes are significant. Until that point in time when the model can choose a single vendor for an entire ring, I believe the current melded approach is the best approximation of the DLC cost in the State of Florida. The fixed proposed by AT&T and MCI is no fix at all since it would mix vendors on a single ring, in clear violation of engineering guidelines.

On the issue of fiber in DLC allocation. Again, the flexibility of allowing the user to specify the allocation approach to use for DLC hard wired and common equipment and fiber is not an easy modeling change and is well beyond the time constraints of this proceeding, yet I am very confident that the current approach used for DLC equipment is correct and adequate.

As I stated in my rebuttal and what seems to be implied by Mr. Donovan and Mr. Pitkin, DLC equipment is sized based on the number of DSOs, therefore there is a cost-causality link that should be used to apportion the cost of the equipment out to services. In contrast, Mr. Donovan and Mr. Pitkin appear to recommend the use of

pair equivalence to build and allocate the DLC equipment. This introduces an unnecessary bias into the model for the apparent needs of less than 1 percent of the services at issue.

Beyond the modeling issues, the real reason for any cost model is to develop accurate cost, which is driven in large measure by the inputs to that model. While I cannot attest to the inputs used by BellSouth nor the resulting cost, runs of the model that I have performed seemed to indicate that the BellSouth filed results are reasonable. In fact, I made a run of the BSTLM with inputs from the Florida universal service order proceeding, Docket Number 980696-TP. However, unlike in a similar run described by AT&T and MCI, we attempted to use all the inputs from this universal service proceeding to the extent feasible.

Based on this run, the BSTLM with BCPM inputs, produced equivalent investments to the results Bellsouth filed in this proceeding. AT&T and MCI's results were an average loop investment of $436. The BellSouth filed results resulted in an average local investment of $852. The BSTLM run with the BCPM inputs resulted in an average loop investment of $832.

The fact that the BCPM values produced lower results can be attributed to the fact that many of the

BCPM inputs are not necessarily representative of BellSouth, but those of Sprint, which were deemed to be lower than BellSouth inputs in the universal service proceeding.

In addition to the comparison of the resulting model average loop investments, the comparison of total network investment shows that Mr. Donovan and Mr. Pitkin's results of $2.6 billion are obviously low, while BellSouth's filed results of $5.2 billion appear more reasonable to the booked amount of 7.1 that was on the books at the end of year 1998.

And that concludes my summary.

MR. ROSS: Mr. Chairman, the witness is available for cross-examination.

CROSS EXAMINATION

BY MR. LAMOUREUX:

Q Good evening, Mr. Stegeman. How are you?

A I'm doing fine.

Q Let me begin by asking you to turn to Page 15 of your rebuttal testimony. Looking at the Q and A that shows up there, in your answer you say there are several material input changes proposed by Mr. Donovan and Mr. Pitkin that would result in the omission of material costs from modeled equipment. These appear to be the result of model misunderstandings or input errors. The troublesome

input changes are as follows, and then in bullet points going on to Page 16 you list several problems. Is that correct?

A That is correct.

Q And your basis for those problems, as you call them, is your review of Exhibit 10 to Mr. Pitkin and Mr. Donovan's testimony, is that correct?

A Yes, that is correct.

Q Did you review the proprietary version of Exhibit 10 that was submitted with Mr. Pitkin and Mr. Donovan's testimony?

A I am fairly sure that I did not.

Q Okay. What I have handed you is a copy of the proprietary version of Exhibit 10 to Mr. Pitkin and Mr. Donovan's testimony. I'm not going to ask you any questions about the actual substance of the information there, I don't want to get into proprietary concerns.

What I would ask is can you tell by looking at that version of the document whether your concerns that Mr. Donovan and Mr. Pitkin in their rerun of the model actually zeroed out several of the inputs as you discussed is accurate?

A This appears to address those issues.

Q So would you agree with me that the concerns that you discuss in the middle of Page 15 continuing over

to 16 are not actually problems that -- you no longer agree that those are problems that Mr. Pitkin and Mr. Donovan had in their rerun of the model, is that correct?

A I would agree.

Q So would you retract your statement that that exhibit somehow indicates model misunderstandings or input errors on the part of Mr. Donovan and Mr. Pitkin?

A Yes, that would. Or, yes, I would.

Q If I could ask you to turn to Page 17 of your rebuttal, and there you are talking about inputs, particular inputs that were used in the USF proceeding. And at Line 3 through Line 5 you say that numerous inputs developed and approved in Docket 980696-TP did not and still do not represent BellSouth in Florida, is that correct?

A That is what it states.

Q Would you agree that in a forward-looking cost model inputs may very well not reflect the embedded practices, costs, or expenses of an ILEC?

A I would agree that they would not match -- they may not match the embedded costs, but they may match the LEC's cost.

Q In your summary I thought I heard you say that one of the advantages you believe of BSTLM, the new loop model, is that it includes more BellSouth data than any

model preceding it. Was that accurate?

A That is correct.

Q Do you believe that the question of how much ILEC data is in a UNE cost model is an appropriate criterion for evaluating that model?

A Yes, I do.

Q Do you believe that is consistent with the FCC's requirement that the model be forward-looking?

A In regards to the customers served, in regards to the wire centers that they serve, in regards to the wire center boundaries that they serve, I do believe that is correct.

Q How about with respect to inputs, particularly let's say material inputs?

A Material inputs in the models should represent the LEC's cost on a going-forward basis.

Q Do you agree with me that the inputs in a forward-looking cost study should be set to represent the best approximation of what forward-looking costs are?

A The inputs into the model should represent the forward-looking costs.

Q In other words, inputs in a forward-looking cost model should also be forward-looking, would you agree with me on that?

A Yes.

Q Would you agree that those inputs should be forward-looking even if they may not necessarily reflect the actual practices or costs of the ILEC in question?

A No, I am not sure I agree with that. I would think that if the cost model is to represent the cost of BellSouth, it should represent the practices of BellSouth going forward.

Q Well, let's say just as a hypothetical that BellSouth pays $100 per foot for 25 pair copper cable, but that there are vendors out there that are selling on the marketplace today that same cable at $75. Do you believe it would be appropriate in that hypothetical to use $100 as the forward-looking input for the cost per foot of 25 pair cable?

A I think you have to look at the suite of inputs altogether to determine which are appropriate and which are not appropriate. And you can't necessarily look at one and say it is inappropriate or not.

Q Well, if it is true that that -- in my hypothetical that that cable is attainable and could be purchased by any ILEC in the marketplace, would you agree that in my hypothetical limited, all other things being equal, the appropriate forward-looking cost for that cable would be $75 and not $100?

A It is hard to assume that without knowing the

other products and services that the companies buy. But if that is a fair market value then I would assume that that is the same value that BellSouth should have in the model.

Q If it is not the same value for some reason that BellSouth has in its actual practices today, would you agree that you should take that fair market value as the forward-looking input value and not whatever value BellSouth has in its practices today?

A I'm not quite sure. I don't like looking at one specific price as a criterion for setting the inputs for all.

Q Well, let's take them as a whole, then. Suppose there was an ILEC right next door to BellSouth, and for the entire suite of material input prices that other ILEC for whatever reason was able to get everything cheaper than BellSouth. Obviously those prices would be obtainable in the marketplace, wouldn't you agree with me?

A Not necessarily. That ILEC may have different economies of scale that they can get better prices from the manufacturers and they are serving a different territory.

Q Let me assume that that other ILEC is actually smaller than BellSouth and it is right next door, so the territory is not that different. And this is a

hypothetical. Wouldn't you agree with me that the material input prices as a whole of that other ILEC are obtainable in the marketplace and, therefore, would be the forward-looking prices, assuming that they are lower than the suite of prices that BellSouth actually has today?

A If you assume all of that and you are looking at the material prices in general, I can picture that you should use those.

Q Is the BSTLM intended to reflect BellSouth's embedded network architecture?

A No, it is not.

Q At Page 17 of your rebuttal -- actually I guess that is the same page we were on -- at Line 2, you say that inputs -- and here you are talking about inputs for the BCPM model -- were argued from the standpoint of developing the engineering practices and resulting costs of the most efficient provider in Florida, is that correct?

A That is what it states, yes.

Q Are you familiar with the source of the inputs that this Commission adopted in its USF order in that proceeding, where they came from?

A I am familiar with a few of the inputs, not all the inputs.

Q Would you agree with me that those inputs came

from actual ILEC data that was submitted by the three ILECs in Florida?

A As I understand, they were, yes.

Q And are you aware that in its filing of the BCPM in Florida, BellSouth for the inputs that it submitted used BellSouth-specific inputs for Florida, are you aware of that?

A I am not aware of that.

Q At Page 18 of your rebuttal, and I think this is something you mentioned in your summary, as well, you talk about the effort of rerunning the BSTLM substituting as many of the USF inputs into that BSTLM as you could to compare that run against the run that Mr. Pitkin and Mr. Donovan made, is that right?

A That is correct.

Q And at Page 18 say that BellSouth made its best efforts of converting all of the inputs approved in the USF docket to the BSTLM, is that correct?

A That is correct.

Q In doing that run for comparison purposes, did you use the 1.5 pairs per household adopted by the Commission in the USF order?

A Yes, we did.

Q You did? You didn't use the two pairs per household value in the BSTLM?

A No, we did not.

Q Did you use the value of three pairs per business adopted by the Commission in the USF order?

A Yes, we did.

Q How about the six-strand fiber cable from the USF order?

A I do not believe we used that.

Q Did you adjust the loading factor for DLC equipment to comport with the installed cost of DLC equipment in the BCPM from the USF order?

A No, we did not adjust DLC as I stated in my testimony. It was too difficult to translate, so we left as is.

Q Now, two of the things that Mr. Pitkin and Mr. Donovan changed when they reran the BSTLM, in addition to using inputs from the USF case, they also used cost of capital and depreciation as AT&T and MCI's witnesses had endorsed early in this proceeding, correct?

A That is my understanding.

Q Okay. Now, in order to do an apples-to-apples comparison of your rerunning of the BSTLM with USF inputs to compare that against Mr. Pitkin and Donovan's rerunning, did you also use either the cost of capital and depreciation from the USF case or the cost and capital and depreciation that Mr. Pitkin and Mr. Donovan used?

A I am not aware of what inputs we used in that portion of the model.

Q Did you change -- in your rerunning of the model, did you change any of the inflation factors to account for the rejection by this Commission of those material inflation factors in the BCPM from the USF case?

A I am not aware if the inflation factors were adjusted or not.

Q How about the in-plant factors?

A The in-plant factors I do know for cable were adjusted since the cable prices from the BCPM had those in-plant loading in the numbers.

Q How about the in-plant factors for DLC equipment?

A As I understand they were not adjusted.

Q And as you ran the BSTLM to do this comparison analysis with the inputs from the USF proceeding, you ran only one of the scenarios and only for one of the elements, is that correct?

A That is correct.

Q And in particular, that element as you ran it assumes less than 100 percent IDLC and assumes some amount of UDLC, correct? And if it helps, the element we are talking about is the SL-1 loop, correct?

A Yes.

Q And since that is not the combos run, that is a different scenario, that element assumes some amount of UDLC and conversely, less than 100 percent of IDLC, is that right?

A If I recall right and it is listed in my exhibit, we used the BST 2000 as the base scenario.

Q And that scenario does not reflect 100 percent IDLC, correct?

A That scenario does not reflect -- does not reflect 100 percent UDLC.

Q Does not reflect 100 percent IDLC? It includes some amount of UDLC in the scenario?

A It does not include, to my recollection, any IDLC.

Q Okay. And one of the changes that Mr. Pitkin and Mr. Donovan made in their rerunning of the BSTLM is they ran only the combo scenario which does assume 100 percent IDLC, and, in fact, 100 percent GR303 IDLC, is that right?

A It assumes 100 percent GR -- it assumes 100 percent IDLC, not necessarily always GR303, and it is not 100 percent for all services because some services are still outside of the IDLC.

Q Okay. Did you do any analysis to determine how much of the differences that you have got set forth on

Pages 19 and 20 of your rebuttal testimony are a result of only using the Commission's material input prices from the USF case and how much actually are a result of other changes made as a result of other issues that Mr. Pitkin and Mr. Donovan address in their testimony?

A No, I did not.

Q Cost of capital is a fairly significant input in the cost model, would you agree with me on that?

A Yes, I would.

Q I want to ask you in particular a couple of questions about the numbers that you have got on Page 20 of your rebuttal. And as I understand, what you have got there is you have got some dollar amounts representing total plant in circuit, poles, and various other structures compared for BellSouth's booked amounts and in the three different runs of the BSTLM, is that right?

A That is correct.

Q I want to talk in particular about the amount that you have got there for the booked amount, okay?

A Okay.

Q Now, you did not develop that number, is that correct?

A No, I did not.

Q You were given that number by someone in BellSouth?

A Yes, I was.

Q And you don't know what is included in that number, is that correct?

A It is as labeled up at the top, the total plant in circuit, poles, aerial fiber, copper intrabuilding fiber, copper underground fiber. Sorry. It is the total plant in circuit, poles, aerial fiber and copper, intrabuilding fiber and copper, underground fiber and copper, buried fiber and copper, and conduit.

Q Okay. But, for example, you don't know whether included in that amount is any dollar associated with BellSouth's deployment of fiber in the loop, do you?

A No, I do not.

(Interruption. Fire alarm.)

CHAIRMAN DEASON: We were told there is going to be some testing. We will give it just a moment. If it doesn't stop, we will just adjourn for the evening.

MR. LAMOUREUX: I don't have much more.

CHAIRMAN DEASON: If you can finish before it goes off again, have at it. (Laughter).

MR. LAMOUREUX: Now, that I don't know that I can do.

COMMISSIONER JACOBS: Otherwise there is fire sale.

BY MR. LAMOUREUX:

Q Also, for example, do you know whether that amount, that booked amount includes any dollars reflecting the amount of investment in circuit equipment for DSL equipment or DSLAM equipment by BellSouth?

A I am not aware if it includes or excludes that.

Q How about any amounts reflecting transport investment?

A I am not aware if it includes or excludes that.

Q Isn't it fair to say that because you don't know exactly what is included in that booked amount figure there, you don't really know whether it is an apples-to-apples comparison with the amounts that you have listed there for the three runs of the BSTLM?

A I recognized it was not an apples-to-apples comparison and that is why I put in my testimony that based upon my experience that approximately 75 to 85 percent of that plant is local loop.

Q The last subject I want it talk about is this issue of DSO equivalence versus per pair. And I want to set up a little bit what the issue is. Would you agree with me the dispute is once you have developed a figure representing the amount of investment for fiber and structure, there is then a question of how you allocate that amount of investment to the various different facilities that you are going to be pricing out as UNEs?

A That is correct.

Q Okay. And the way BellSouth has done it in the BSTLM is it allocates that out based on DS-0 equivalence, and what AT&T and MCI are recommending is that allocation be done on some other basis, preferably a per pair basis?

A That is correct.

Q Okay. Would you agree with me that the cost of a given length of fiber does not vary depending on the capacity to which that fiber is used? In other words, a 100-foot length of fiber doesn't cost more whether it is being used as a DS-1 or a DS-0?

A It depends.

Q It depends?

A It depends. It depends if that DS-1 is a fiber fed high cap service that has separate fibers provisioned in that versus if it is on a DLC ring.

Q Well, what I want to talk about specifically is the same strand of fiber.

A Okay.

Q Would you agree with me that a given stand of fiber, not looking at any electronics or any of the other equipment that may be on either end or in the middle of that fiber, that same strand of fiber is not going to cost more if you attach enough electronics on it to make it run DS-1 or whether you just pump DS-0 capacity through it?

A For the most part I would agree, yes.

COMMISSIONER JABER: Let me make sure I understand that. And if I could also ask you speak right into the mike for me. It's hard to hear way down here. The cost of the fiber is not based upon the use of the fiber?

THE WITNESS: As the model was designed, the number of fibers put in is driven by how many DLC rings you have and how many high cap rings you have flowing on that route. So it does depend upon not the services, just what electronics are tied on the end.

COMMISSIONER JABER: All right. So what you put upon the fiber, what you add to it?

THE WITNESS: Well, it is more driven by the number of rings that traverse that segment. And if you have multiple DLC rings being served on that segment you will have more fibers because the input into the model is so many fibers per DLC ring.

BY MR. LAMOUREUX:

Q And I guess what I'm trying to find out is since a given strand of fiber doesn't cost any more in the real world whether it is being used for DS-1 or DS-0, generally, would you agree that allocating fiber and structure investment based on capacity in terms of DS-0 equivalence is an arbitrary exercise in that allocation?

A I would agree for fiber that the apportionment or the allocation of that cost is an arbitrary exercise because it is driven by number of fibers per ring.

Q Would you agree that an allocation method that is based on the number of DS-0 equivalence -- let me back up. We should clarify what we are talking about. When we talk about DS-0s and DS-1s, generally a DS-1 is just a greater capacity -- a greater number of channels that you can put through on that same amount of fiber, and it is typically about 24 DS-0s, is that about right?

A That is my understanding, yes.

Q Would you agree that using an allocation method of allocating this investment on a DS-0 equivalent basis tends to allocate proportionately more investment to advanced services versus a per line or per pair allocation methodology, which would tend to allocate proportionately more to plain old telephone services?

A I would tend to agree with that, that a DS-1 that is traversing the same fiber segment will get more costs than a POTS service traversing that same segment of fiber.

Q And if would you assume hypothetically that an allocation method based on pair counts, so a per pair allocation method is your starting point for an appropriate allocation method, okay. In other words,

instead of using your DS-0 allocation method, we decide to use a per pair allocation method. Wouldn't you agree that using a DS-0 equivalent allocation method from that perspective also results in a bias?

A I'm not sure I understand.

Q Would you agree with me the question of whether the allocation method results in a bias just depends on the framework from which you are starting and from which you are looking at the question to determine whether there is a bias or not? And if I could add to that; if you start from the assumption that we should allocate on a DS-0 basis then maybe a per pair basis has some bias, but if you start with the assumption that it should be on a per pair basis then the DS-0 method is going to have some bias?

A Yes. Depending upon what is decided as the appropriate allocation for that fiber, then one method will introduce a bias over the other method depending on what you are looking at. But it is a bias on the service costs, but not a bias in the total network cost.

Q The total amount of investment may be --

A The same.

Q -- the same, but the allocation of that investment to the different services or UNEs may be different depending on the allocation method that is

chosen?

A That is correct.

Q BCPM allocates fiber and structure not on a DS-0 basis, is that right?

A As I best recall, the fiber and the structure cost associated with that fiber is apportioned based upon service counts.

Q And when you say service counts, is that the same thing as on a per pair basis or is that something different?

A In the BCPM it was designed as a universal service model and it modeled for the most part POTS lines. POTS line was considered a service which is equivalent to a pair.

Q So more or less the BCPM allocates that fiber and that structure cost on a per pair basis?

A That is correct.

MR. LAMOUREUX: That's all I have.

CHAIRMAN DEASON: Okay. We are going to recess for the evening. We will resume cross-examination of this witness in the morning. We will start at 9:15 tomorrow. And if we can reschedule some things we may even start earlier the next morning, but we will see on that. But tomorrow 9:15.

MR. MELSON: Commissioner Deason, before we

adjourn, during the last break we talked briefly with BellSouth about the videotape. And I'm not -- I think we are probably close, I'm not sure we have got complete agreement.

My understanding is BellSouth's proposal is that they would make the videotape available to us as we leave the hearing this evening and that they would use it essentially as part of their direct case in conjunction with Mr. Greer's summary. What I am unclear about is how much of it they intend to use.

I note in the prehearing order when Mr. Riolo was given 15 minutes to do a demonstration that BellSouth was allowed the opportunity to do a 15-minute counter demonstration. And I'm not sure I have a clear understanding of whether they expect to be able to confine their use of the video to roughly 15 minutes or not.

CHAIRMAN DEASON: Mr. Edenfield.

MR. ROSS: Commissioner Deason, I certainly don't recall any limitation of 15 minutes from the prehearing conference. And, basically, just because Mr. Riolo's position is that it only takes 15 minutes, certainly BellSouth's position is that it takes a lot longer than that.

Now, with regard to how long or how much of the tape we wanted to show, the tape is an hour and fifteen

minutes. There are some parts that could be edited out. I don't know that I can edit it down to 15 minutes and give you anything that is going to make sense.

As I understand it, there is the ability to fast forward through some parts and certainly we would avail ourselves of that. To the extent we get the point across, then we can fast forward through some of it. But I think that in fairness BellSouth should be given the opportunity to present as much of the tape as we deem necessary to get our point across as to the amount of time it really takes to remove a load coil. And that is exactly what Mr. Riolo is going to be doing.

MR. MELSON: Commissioner Deason, I have got two points. The prehearing order, and I am reading from Page 71, BellSouth is also allowed the opportunity to perform a 15-minute counter demonstration by one of its witnesses during that witness' summary subject to appropriate objection.

Second, I would point out that Rhythms -- Mr. Riolo has performed his demonstration once during a deposition. And, you know, the parties had adequate opportunity to see that. We are dealing with this at the last minute. And I just hope that whatever the Commission does here is fair, because essentially BellSouth is supplementing Mr. Greer's testimony here on the day before

he goes on the stand.

MR. ROSS: My apologies. That is in the prehearing order, I just don't remember that being discussed in that manner during the prehearing. Certainly we had raised some objections and some foundational issues which we are not going to have at this point, but I don't recall us agreeing to limit it to 15 minutes.

The idea was if they put on a demonstration we would as well, but it is in the prehearing order that way. That was not the intention we had when we were discussing our putting on a counter demonstration.

CHAIRMAN DEASON: Well, it appears me that given the progress that we have made today time is going to be at a premium for the remaining three days. And so I think you need to do your best to limit it to 15 minutes. If you absolutely cannot do it, we will discuss it further, but I'm depending on you to give it your best effort.

MR. ROSS: I will do that.

CHAIRMAN DEASON: Anything further for this evening?

Remember, tomorrow 9:15. We are adjourned for the evening.

(The hearing adjourned at 6:15 p.m.).

(Transcript continues in sequence in Volume 11.)

STATE OF FLORIDA)

: CERTIFICATE OF REPORTER

COUNTY OF LEON)

I, JANE FAUROT, RPR, Chief, FPSC Bureau of Reporting Official Commission Reporter, do hereby certify that the Hearing in Docket No. 990649-TP was heard by the Florida Public Service Commission at the time and place herein stated.

It is further certified that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript, consisting of 187 pages, Volume 10 constitutes a true transcription of my notes of said proceedings and the insertion of the prescribed prefiled testimony of the witness(s).

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorneys or counsel connected with the action, nor am I financially interested in the action.

DATED this THIS 21st DAY OF SEPTEMBER, 2000.

JANE FAUROT, RPR
FPSC Division of Records & Reporting
Chief, Bureau of Reporting
(850) 413-6732