

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

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

VOLUME 9

Pages 1007 through 1079

PROCEEDINGS: HEARING

BEFORE: CHAIRMAN JULIA L. JOHNSON
COMMISSIONER J. TERRY DEASON
COMMISSIONER SUSAN F. CLARK
COMMISSIONER JOE GARCIA
COMMISSIONER E. LEON JACOBS, JR.

DATE: Tuesday, October 13, 1998

TIME: Commenced at 9:10 a.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

REPORTED BY: CATHY H. WEBSTER, RPR

APPEARANCES:
(As heretofore noted.)

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NAME

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KEVIN DUFFY-DENO

Continued Cross Examination Lamoureux 1010

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INDEX OF EXHIBITS

ID ADMITTED

No exhibits identified or admitted in Volume 9

1 P R O C E E D I N G S

2 (Transcript follows in proper sequence from
3 Volume 8.)

4 WHEREUPON,

5 KEVIN DUFFY-DENO

6 was called as a witness on behalf of BellSouth and, having
7 been duly sworn, testified as follows:

8 CONTINUED CROSS EXAMINATION

9 A As I've said the last three times I've answered
10 that question, no, I disagree with your statement.

11 BCPM does spatially locate customers.

12 Does it assign a different latitude and longitude
13 to each housing unit? No, it doesn't.

14 Can we argue that BCPM does say, well, we've
15 located housing units to a microgrid; that microgrid has a
16 spatial orientation. If we took a map of Florida and
17 overlay -- we would overlay the microgrids, those
18 microgrids aren't random. They have a spatial
19 orientation. Their perimeters are defined by latitude and
20 longitude.

21 COMMISSIONER GARCIA: But you can't hit a house?
22 You can hit -- You can hit close, but you just can't hit
23 the house on a map? In other words, you can't pinpoint the
24 individual customer?

25 A Correct.

1 COMMISSIONER GARCIA: You could probably bomb
2 them, but you just couldn't shoot them?

3 A Yeah; correct.

4 What we do is we say within this one-tenth of a
5 square mile area, there likely are ten houses, but we don't
6 know exactly where those ten houses are within that small
7 area; yeah.

8 BY MR. LAMOUREUX (Continuing):

9 Q Let me see if I can draw a simple example, see if
10 that might help. I'm sure there are no actual grids that
11 are going to look this way, but I want to pick something
12 simple.

13 Suppose you've got a census block that's a
14 square. You've got four -- I'm sorry; yeah -- census block
15 that's a square. You've got four microgrids that are
16 squares inside that census block; okay, just to keep things
17 simple.

18 A Okay.

19 Q The way BCPM works, as I understand it, is let's
20 say there's 100 total miles of road in the census block.
21 Okay. And it calculates that in this microgrid there are
22 25 miles; in this microgrid there are 50 miles; in this
23 microgrid there are 15; and in this microgrid there are
24 100; is that right?

25 A You mean 10?

1 Q Thank you. Ten. For a total of 100.

2 As I understand it, what BCPM does is it says for
3 this upper left hand quadrant, since this microgrid has 25
4 miles out of the total miles of 100, there are 25% of the
5 customers in the census block in this microgrid?

6 A That's a fair characterization.

7 Q Okay. So to keep things simple, if there are 100
8 customers total in the census block, BCPM would allocate 25
9 customers to this microgrid in my simple example?

10 A In your simple example, yes.

11 Q Okay.

12 A Yeah.

13 Q And while the microgrid has a spatial location,
14 BCPM does not locate any of the individual 25 customers in
15 that microgrid, within that microgrid?

16 A Within -- Correct. Within the microgrid, as I
17 just explained, BCPM will say, yes, there are likely 25
18 housing units or customers within that microgrid, but it
19 doesn't make a determination within that microgrid where
20 they might likely be.

21 COMMISSIONER GARCIA: But it's that broad of a
22 concept? Twenty-five miles, it assigns twenty-five people
23 because that's a quarter of the area within that space;
24 right?

25 If we're talking about 100 miles, 100 customers,

1 you'd divide it into four quadrants: one quadrant had a
2 quarter of the miles and therefore you gave it a quarter of
3 the population?

4 A That's what it is.

5 COMMISSIONER GARCIA: So you wouldn't even be
6 able to bomb it? You just know they're in this area?

7 A Well, it depends on the strength of your bomb.

8 COMMISSIONER GARCIA: Right.

9 COMMISSIONER DEASON: Let me ask you: When you
10 say that the microgrid is one-tenth of a square mile, is
11 that one-tenth mile by one-tenth mile?

12 A It's 1500 feet by 1700 feet. So I'm not quite
13 sure if that's a tenth by tenth, but the dimensions are
14 1500 by 1700 feet.

15 COMMISSIONER GARCIA: But that microgrid is much
16 bigger?

17 A Well, good point.

18 Yeah, he drew a very large microgrid.

19 COMMISSIONER DEASON: There is no microgrid that
20 could have 25 miles of road in it?

21 A That would be a very large microgrid, yes. And
22 it would not be a microgrid used by BCPM.

23 COMMISSIONER DEASON: If a microgrid -- I
24 understand it depends on the longitude and latitude and
25 where you are on that as to the configuration of the

1 microgrid?

2 A Correct.

3 COMMISSIONER DEASON: If the shape of the
4 microgrid in Florida is different than Maine?

5 A Slight variation; yes.

6 COMMISSIONER DEASON: But if it's generally
7 one-tenth of a mile, you're basically one-tenth of a square
8 mile, one-tenth by one-tenth, you're talking 6.4 acres,
9 which is a pretty small area?

10 A Uh-huh. I don't know what the translation is to
11 acres, but --

12 COMMISSIONER DEASON: Well, a square mile I think
13 is 640 acres.

14 I think a square mile is 640 acres. So
15 generally 6.4 acres. You're talking about -- 6.4 acres,
16 you're talking about a few house lots, you know, large
17 house lots?

18 A We're talking not a very large area.

19 MR. MELSON: Sixty-four.

20 COMMISSIONER DEASON: No, if it's one-tenth mile
21 by one-tenth mile, that's 1/100th of a square mile. So it
22 would be 6.4 acres.

23 I'm trying to get an order of magnitude.

24 Or is it 64 acres?

25 A I don't know. I don't know.

1 COMMISSIONER DEASON: Well, see, it depends on
2 how you determine your microgrid. If the dimensions on it
3 is one-tenth of a mile by one-tenth of a mile, that's
4 1/100th of a square mile.

5 If it's one-tenth -- If you take a square mile
6 and divide it into ten rectangles, then each one of those
7 rectangles is 64 acres generally. And I'm trying to
8 understand are we talking 6.4 acres or 64 acres?

9 A Let me see if I can get an answer to you before I
10 go off the stand.

11 The dimensions of a microgrid is 1500 by 1700
12 feet in general. And let's see if we can convert that to
13 acres.

14 COMMISSIONER GARCIA: Let's go back because we
15 represented there microgrid that was 25 miles by 25 miles.
16 Is that a possible in your mind?

17 A Twenty-five miles within this -- I doubt it.
18 That's a -- That would be --

19 COMMISSIONER GARCIA: Why would that happen? Why
20 would you get a microgrid of that size?

21 A Well, you're not expanding the size of the
22 microgrid. You would be cramming a lot of roads in that
23 microgrid.

24 COMMISSIONER GARCIA: Gotcha. Is that possible
25 to put 25 miles?

1 A Twenty-five miles?

2 Intuitively it doesn't seem possible, but to be
3 absolutely --

4 COMMISSIONER GARCIA: In Florida, in an area that
5 small. I mean, let me understand: The microgrids don't
6 change in size?

7 A Correct.

8 COMMISSIONER GARCIA: It's only their density?

9 A Correct.

10 COMMISSIONER GARCIA: And their density by the
11 number of miles that are in there of roadway?

12 A It's one way to characterize the density, yes.

13 COMMISSIONER GARCIA: So the only way you get
14 that kind of -- I'm trying to think in my mind how you get
15 that kind of density. I guess a downtown area?

16 A That's the only place.

17 COMMISSIONER GARCIA: But I don't know how you
18 could get 25 miles of roadway in 6.4 acres or whatever,
19 one-tenth by one-tenth.

20 A It seems -- Maybe Mr. Lamoureux can come up with
21 a better number.

22 BY MR. LAMOUREUX (Continuing):

23 Q Well, suppose --

24 COMMISSIONER DEASON: Just one second. If it's
25 1500 feet by 1700 feet, it's more than 6.4 acres.

1 A Okay. It must be in the magnitude of 64 acres.

2 BY MR. LAMOUREUX (Continuing):

3 Q Isn't it a tenth of a square mile?

4 A It's a tenth of a square mile, but it's 1500 by
5 1700 feet, so.

6 Q Let's say you've got X miles of roads in that
7 Microgrid. Okay. Just to keep the numbers out of there.
8 And let's say you figured out --

9 COMMISSIONER GARCIA: I'm sorry. What was the
10 -- Forgive me. We were still discussing acres. What was
11 the first variable you began with?

12 MR. LAMOUREUX: X; trying to get the numbers out
13 this time.

14 BY MR. LAMOUREUX (Continuing):

15 Q These two grids look at all the roads that run
16 through this microgrid and calculated, there are X miles of
17 road in the microgrid, I mean, in the census block.

18 A Correct.

19 Q Okay. Let's say, you know, that there are
20 quarter -- just keep real simple -- a quarter in each
21 microgrid, proportionate of those roads. So this microgrid
22 has a quarter of that amount of roads in the microgrid.
23 This microgrid has a quarter of X in that microgrid and so
24 on.

25 What BCPM does is based on that pro rata share of

1 the road mileage in the census block assigns an amount of
2 customers to a microgrid?

3 A That's correct; yeah.

4 Q And a microgrid is 1500 by 1700 feet?

5 A Give or take some, yeah. I would note that when
6 we're talking about rural areas, those census blocks tend
7 to be very large. So you wouldn't have just four
8 microgrids. You would have a very large number of
9 microgrids within a census block, rural census block
10 microgrid.

11 COMMISSIONER GARCIA: And there are lots of
12 microgrids and two or three people or something?

13 A In some cases, yeah. In some cases not a lot of
14 roads.

15 BY MR. LAMOUREUX (Continuing):

16 Q And just to be clear, this method of assignment
17 based on road mileage, that's typically done for the rural
18 areas? There's a different method of assignment for the
19 more dense areas?

20 A That's correct. And to be specific, census
21 blocks that are less than a quarter square mile in size,
22 the apportionment of customers within that census block is
23 simply done in land area to a microgrid. Apportionment to
24 microgrids is simply done on basis of land area. For
25 census blocks greater than a quarter of a square mile, we

1 use the roads. And since we're talking about rural areas
2 or high cost, obviously we focus on the road methodology.

3 MR. CARVER: Excuse me for just a moment. I've
4 just been advised that a microgrid is 58.5 miles. And I
5 have the calculation here that I can provide to the witness
6 in case anyone has questions about how that was arrived at.

7 COMMISSIONER JACOBS: You mean 58.5 acres?

8 MR. CARVER: I'm sorry. Yes, that would make a
9 difference; wouldn't it. Fifty-eight point five acres;
10 sorry.

11 A If it was 58 miles, I would have to go home.

12 MR. CARVER: And, if I may, I would like to
13 provide the calculation to the witness.

14 COMMISSIONER GARCIA: Mr. Carver, if I can ask, I
15 know you didn't do that calculation. Who in BellSouth has
16 the technical capacity to do that?

17 MR. CARVER: I believe the calculation was done
18 by one of the members of the Georgetown group who will be
19 taking the stand as a rebuttal witness later this week.

20 A Would you like me to -- Would you like me to
21 convey to you what the --

22 COMMISSIONER D'ASON: I assume what you did is
23 you took 1500 by 1700 and calculated the square footage,
24 and divided that in -- and then -- I mean, divided it into
25 the number of square feet in an acre to determine the

1 number of acres?

2 A Actually, what they did is they converted it into
3 square miles and they said there were 640 acres per square
4 mile. Same answer.

5 COMMISSIONER GARCIA: Then they took a satellite
6 picture, reduced it.

7 MR. CARVER: And then we bombed the microgrid.

8 BY MR. LAMOUREUX (Continuing):

9 Q Okay. Dr. Duffy-Deno, all this was prelude. All
10 I wanted to ask you --

11 A Have you made your point yet?

12 Q While BCPM apportions or allocates a number or a
13 count of customers to a microgrid, it never locates
14 individual customers within that microgrid?

15 A It does not explicitly locate customers within
16 that microgrid. And, as I said before, for talking
17 purposes, since it is a road-based methodology, you could
18 argue that they are all located at the road centroid at the
19 microgrid.

20 Q But BCPM itself does not do that?

21 A It does not explicitly do that, no.

22 COMMISSIONER GARCIA: Does that tend to hurt the
23 company in its calculations, the fact that the way you
24 allocate them within that microgrid puts them near roads
25 and the possibility is that they're off those roads?

1 Do you think that's conservative for your
2 estimates to calculate? I mean, I want you -- From our
3 perspective, we're clearly trying to be conservative. Does
4 it help or hurt you that you don't know specifically where
5 they are, that I am calculating on reaching out to them?

6 A It's a good question.

7 I think the answer is, or the way I would answer
8 it is that it depends on how fine do you want to get in
9 terms of locating customers. Do we need to go down to a
10 latitude and longitude for each estimated customer, or is
11 it enough to identify the likely number of customers within
12 a small area?

13 I don't -- I haven't seen a cost analysis that
14 would compare those two to tell you if it makes a large
15 difference.

16 The BCPM sponsors obviously --

17 COMMISSIONER GARCIA: Why is it that the Hatfield
18 folks think it's so important to know exactly what that
19 estimate is?

20 A Well, it's important to know where customers are
21 located, number one.

22 Okay. I think it's more a matter of a different
23 estimating methodology. They felt that by using address
24 geocoding that they could more accurately locate customers
25 in an area than using roads, but we haven't seen any proof

1 of that.

2 COMMISSIONER DEASON: Would you agree it kind of
3 boils down to whether you want a high degree of specificity
4 for each customer, realizing in some rural areas you may
5 only be able to do that for 20 or 30% percent of those
6 customers as opposed to a general location for all of the
7 customers?

8 In other words, you say you have a location for
9 all of the customers and you do that on mileage. As I
10 understand the Hatfield, they can only geocode a certain
11 percentage of customers based upon the limitations of their
12 database. So while they can highly predict where -- show
13 where customers are in rural areas, it might be for only 20
14 or 30% percent of those customers?

15 That's -- In comparison, that's what we're trying
16 to find out which methodology is best. Would you agree
17 with that general characterization?

18 A I would agree with that general characterization.
19 I think you hit the nail on the head.

20 We've got two methodologies. And I would throw
21 one other issue into the pot. And that is the cost of
22 doing this. The census data upon which BCPM is based is
23 free. The only cost involved is the processing cost, which
24 is not a whole heck of a lot.

25 The geocoding, the address geocoding, is

1 considerably more expensive just for the data. So I'd
2 throw that into the pot, also.

3 But what we fundamentally are based with is a
4 comparison between two methodologies designed to estimate
5 customers.

6 BCPM, because roads are -- The road database is
7 comprehensive, we know basically where all the roads are,
8 but we don't know where all the addresses are.

9 And even if we had all the addresses, we don't
10 know how those addresses translate into specific streets.

11 COMMISSIONER DEASON: Well, have you attempted to
12 use the best of both, in the sense that you use the
13 geocoded data for those which you have addresses and you
14 can do that, and then for those that you don't, you just
15 use your methodology of allocating based upon road mileage
16 within each quadrant, or not quadrant, but each microgrid?

17 A Well, that issue has been looked into a lot. The
18 FCC was struggling with that issue.

19 I know that Sprint in this proceeding, Dr. Brian
20 Staihr, presents an analysis where geocoded data was used
21 in BCPM instead of the roads. And in that analysis there
22 wasn't very -- It was I think one and a half percent
23 difference in the estimated cost. So for those areas, the
24 geocoded data didn't really add anything to the --

25 COMMISSIONER GARCIA: I'm sorry; what was that

1 again?

2 A What Sprint did is they took for -- I don't
3 recall exactly -- I'll say five wire centers. They
4 geocoded their customer data, address geocoded, and then
5 put that data into BCPM. That is, once you've got spatial
6 estimation of customers, you can overlay the microgrids and
7 populate the microgrids with that data.

8 And the results of that, when you compare it with
9 the standard BCPM run, was that the cost difference was on
10 the order of magnitude of a percent and a half.

11 So, doesn't make a lot of difference.

12 Now combining data, if you've got address
13 geocoded data for some, it doesn't make sense to use a
14 road-based methodology for the others.

15 There are some problems there when you combine
16 address geocoded data with some other methodology and you
17 can introduce some bias into your overall estimation of
18 customers within that area.

19 I know there is an exhibit to Dr. Staihr's
20 testimony which was an FCC ex parte, which talks just about
21 that issue.

22 So the proposals that I have seen, and I believe
23 the proposal being made by the BCPM sponsors, is that if
24 you want to go that route, that you use -- And you decide
25 that address geocoding is the way to go, you would use

1 address geocoding only when the success rate is extremely
2 high. And I think the number being thrown out is 80% or
3 higher. And then in all other areas you use a road-base
4 methodology, and maybe even a more refined one like we
5 talked about earlier where you look at specific types of
6 roads.

7 But that is completely consistent with the BCPM
8 methodology. If you want to go with geocoding, BCPM can
9 incorporate that data. You don't need to go to another
10 model.

11 COMMISSIONER GARCIA: Doesn't that capture the
12 majority of it? I mean, aren't the anomalies those
13 specific outlying areas?

14 In other words, when you're talking about 58
15 acres, I think the number was -- or what is it -- 1500 by
16 1200, whatever, the microgrid; when we're talking about the
17 microgrid, when we're talking about an area like -- I don't
18 know -- downtown Miami, if you were to overlay that with
19 specific address information, we'd probably have a pretty
20 complete record?

21 A It would -- I don't know if it's complete, but
22 it's certainly very high.

23 COMMISSIONER GARCIA: Very high?

24 A Yeah.

25 COMMISSIONER GARCIA: So when we're looking at

1 these outlying areas, although they may incorporate the
2 majority of territory, we're talking about a very small
3 minority of customers?

4 A We're talking about a very small portion of the
5 customers, but we are talking about the majority of the
6 high cost of serving areas.

7 And because address geocoding fails miserably in
8 these areas, assuming you use this hybrid approach, you
9 essentially would be using address geocoding for your
10 heavily urbanized areas where really probably doesn't make
11 a heck of a lot of difference if you use roads or area
12 allocation or address.

13 COMMISSIONER GARCIA: You said it makes at most a
14 one and a half percent difference?

15 A That's what Dr. Staihr found, yeah.

16 And in your rural areas, you would use the BCPM
17 methodology of allocating along the roads.

18 BY MR. LAMOLINA (Continuing):

19 Q Just to follow up on a question from Commissioner
20 Garcia, the smallest density levels, where the geocoding
21 rate is low, those density levels typically have 1% or less
22 of the State's entire population; don't they?

23 A Typically, yes, but what percent of the cost is
24 in those areas? I would guess that's considerably more
25 than 1%.

1 Q I just want a couple of last questions to wrap up
2 this line of questioning.

3 The finest level of geographic specificity that
4 BCPM uses to locate customers is the roughly 58-acre area
5 of the microgrid?

6 A Fifty-nine acres.

7 Q Okay.

8 A That's correct; the microgrid.

9 Q And the finest level of geographic specificity
10 that Hatfield uses to locate customers is the actual
11 longitude and latitude point of individual customers?

12 A No, not the actual.

13 Q Okay.

14 A Okay. We're talking -- You know, just so we're
15 careful.

16 COMMISSIONER GARCIA: Actual of the ones they
17 found?

18 A But it's the actual of the address. Address
19 geocoding -- And that's why I like to use the term
20 "address geocoding." You're not identifying the latitude
21 and longitude of a house. That database doesn't exist,
22 unless the Pentagon has it.

23 What you're identifying is the latitude and
24 longitude of an address as placed on a road. And we're
25 trying to identify the spatial location of houses and

1 business structures. That's a customer. That's to where
2 the plant is built.

3 So just as long as we're careful as to when we
4 use the term "actual."

5 BY MR. LAMOUREUX (Continuing):

6 Q Let me ask the question a little more finely
7 then. The finest level of geographic specificity that BCPM
8 uses to estimate customer location is the microgrid?

9 MR. CARVER: I'm going to object at this point.
10 I think he's answered that question two or three times as
11 to both BCPM and Hatfield. And Mr. Lamoureux keeps asking
12 the same question over and over regarding customer
13 location.

14 MR. LAMOUREUX: In answer to my last question, he
15 changed the words that were in my question. That's why I'm
16 asking the question again and with different words.

17 CHAIRMAN JOHNSON: I'm going to allow the
18 question.

19 BY MR. LAMOUREUX (Continuing):

20 Q I just want to make sure we get an apples to
21 apples comparison of the constructs used in the two models.
22 The finest level of geographic specificity that BCPM uses
23 to estimate customer locations is the microgrid?

24 A That's correct.

25 Q And the finest level of geographic specificity

1 that Hatfield uses to estimate locations of customers is a
2 latitude and longitude point?

3 A Is a latitude and longitude point. The only
4 caveat would be that it is an estimated point. And we also
5 have to remember that the Hatfield customer location
6 methodology consists of two parts.

7 We've got address geocoding, but we also have
8 this other census block perimeter placement, which in the
9 rural areas is the dominant point of estimation.

10 Do they assign a latitude and longitude? Yes.

11 How accurate it is, you don't know.

12 Q Just to be clear, let's say you've got a census
13 block. And Hatfield geocodes some number of customers in
14 that census block, and then there are some other customers
15 that can't be geocoded and they are placed on the boundary
16 of the census block; right?

17 A That's correct.

18 Q But all of those customers, including the ones
19 that were placed on the perimeter of the census block are
20 assigned a latitude and longitude point?

21 A That's correct, yes.

22 The question, though, that goes begging is how
23 well does that methodology predict. I could place a point
24 at any latitude and longitude, but is that where a house
25 actually might be?

1 Q Going back to BCPM, although BCPM begins from an
2 assumption that customers are located on or along
3 roads, the model itself does not actually have a process
4 for locating customers on roads?

5 A That's correct. Within a microgrid, customers
6 are assigned to a microgrid, for example, ten customers to
7 a microgrid; BCPM does not go any further and say, well,
8 those ten customers are along this particular road in that
9 microgrid. That capability does exist. The processing,
10 though, would be increased significantly to make that
11 determination.

12 Q And BCPM assumes that each road that's used in
13 the calculation of road mileage and therefore used to
14 assign proportions of customers to a microgrid, each one of
15 those roads is equally likely to have customers on it?

16 A That is correct. As I said earlier, that is,
17 though, a refinement that I personally would like to see
18 happen.

19 Q So if a state highway cuts through a microgrid
20 and there's also a residential street in that
21 microgrid, the BCPM assumes that each of those two roads is
22 equally likely to have customers on it?

23 A It does. It does. And, you know, again, we can
24 sit here all day and argue about assumptions, but how well
25 does the methodology predict. I assume you're going to get

1 to that.

2 Q An effect essentially of the assumption that each
3 road is likely to have customers on it is that customers,
4 you can draw a conclusion that customers are equally spaced
5 out along all the roads in the microgrid, too; is that
6 correct?

7 A Yeah, that would be a logical conclusion. BCPM
8 doesn't explicitly make that assumption, but it would be a
9 logical conclusion.

10 Q Well, in fact, don't you say in your rebuttal at
11 page 17 that BCPM effectively assumes that within each
12 microgrid all customers are evenly spaced along all roads?

13 A Well, when I use the term "effectively," that's
14 what I mean.

15 It doesn't explicitly make that conclusion, but
16 you could logically infer that from the methodology.

17 Q Okay. And in terms of using roads to distribute
18 the customers, BCPM does not use all the roads that might
19 be found in the State of Florida; some roads are excluded?

20 A That's true. True. BCPM makes -- The developers
21 made a determination as to what roads people typically
22 might live along.

23 As an example, a road that goes -- Roads -- First
24 of all, just some background: When we talk about roads,
25 the census uses what are called "road segments." And if

1 you think of Main Street that might be two miles long, that
2 two-mile stretch of road is divided into many, many, many
3 road segments, where road segment is the distance between
4 an intersection.

5 So if you consider a road that goes underneath
6 another road, that road segment would be excluded because
7 there are no houses or business structures under that or in
8 that underpass. Roads that go through tunnels are
9 excluded. Limited access highways are excluded.
10 Four-wheel drive dirt roads are excluded. Those are the
11 ones that come to mind.

12 Q Okay. But state highways, though, are one
13 category of roads that are included?

14 A To the extent that it is not a limited access
15 highway, yes, it's included.

16 Q Just as an example, if there was a microgrid that
17 covered the Big Cypress National Preserve, which is a
18 nature preserve in Osceola National Forest, if there was
19 road mileage in that microgrid, that road mileage would be
20 used to allocate customers in those microgrids that cover a
21 national park, a nature preserve, or areas like that, as
22 long as they had road mileage in them?

23 A In the -- Yes.

24 COMMISSIONER GARCIA: All right. Before you move
25 off, explain to me why that cost allocation wouldn't be

1 correct because obviously that's what he's driving at.

2 I can't cross him. But why is that allocation --

3 A If only we could.

4 COMMISSIONER GARCIA: Why is that allocation
5 wrong? Why is that allocation wrong?

6 I mean, clearly, if you've got someone there,
7 you have to allocate them somewhere. You allocate them
8 along that national road, what differential would that
9 produce compared to the Hatfield Model?

10 A Well, relative to the Hatfield Model, I don't
11 know. But to address I think your general --

12 COMMISSIONER GARCIA: Philosophically, though,
13 you could probably tell me what the distinction is.

14 A Well --

15 COMMISSIONER GARCIA: If you can't, you can't; I
16 understand.

17 A Well, let me -- Let me -- Let me kind of reverse
18 your question and address his first.

19 COMMISSIONER GARCIA: That's fine.

20 A And then maybe an answer to yours will pop out.
21 You've got a national forest, nature preserve,
22 and you've got roads through it. If those roads --

23 COMMISSIONER GARCIA: Roads which are already in
24 microgrid format. So you've got hundreds of microgrids in
25 that area?

1 A Correct, hundreds of -- Yeah, that's a fish net
2 we lay over the whole state.

3 COMMISSIONER GARCIA: Right.

4 A /ou've got roads in those areas. And let's
5 assume they are part of the roads that BPCM incorporates in
6 their assignment process.

7 Yeah, if it's a state highway that's not a
8 limited access that goes through this area, that's part of
9 the road data base.

10 Question, though, is -- I think Mr. Lamoureux
11 driving at, well, isn't that kind of odd to assign
12 customers to a natural preserve or a national forest.

13 Maybe I'm wrong, but if he is making that,
14 driving at that point, I need to point out that people do
15 live in those areas. And we only allocate or assign
16 housing units from a census block to a microgrid if that
17 census block is populated.

18 So if you have a census block overlaying a nature
19 preserve and there are people living within that census
20 block, and the roads within that nature preserve are part
21 of the road database, then, yes, and a road goes through a
22 microgrid, customers -- those census housing units will be
23 allocated to a microgrid that could lie within a nature
24 preserve. If there are people living there, they need
25 service.

1 COMMISSIONER GARCIA: I'm sorry for pulling you
2 away from your line.

3 MR. LAMOUREUX: That's okay.

4 COMMISSIONER GARCIA: I just wanted to get a
5 better understanding.

6 MR. LAMOUREUX: Well, I've never been accused of
7 being obtuse and so let me try and -- I want to narrow in
8 exactly what I'm trying to get at.

9 BY MR. LAMOUREUX (Continuing):

10 Q Since BCPM distributes customers based on road
11 mileage, if an ultimate grid has the right sort of roads in
12 it that BCPM looks at, BCPM might still build plant to that
13 ultimate grid even in the real world it was known somehow
14 that no one actually lived in that ultimate grid if there
15 were roads running through that ultimate grid?

16 A Okay. The answer is yes, but we need to make a
17 jump here. We've been talking about microgrids all morning
18 and now we've got a new concept called an ultimate grid.

19 So the answer to Mr. Lamoureux's question is, yes,
20 it is possible, but we need to spend a little bit of time
21 getting ourselves from the microgrids up to the ultimate
22 grid.

23 COMMISSIONER GARCIA: I didn't understand the
24 distinction of his question. His question was that we
25 would run, theoretically we would run service to that area.

1 There is a cost of serving that area and there is no one
2 there?

3 A That's what he's driving at, yes.

4 COMMISSIONER GARCIA: Why would there not be
5 anyone there if it's a census block that is determined that
6 there is supposedly someone there?

7 A Well, I can draw a picture.

8 COMMISSIONER GARCIA: Probably be helpful to me.

9 A It's helpful to me, too.
10 If I can find my picture.

11 Yeah. There it is.

12 Okay. Do you understand microgrids versus
13 ultimate grids?

14 COMMISSIONER GARCIA: I know there's 58 acres,
15 but give me the ultimate grid, the distinction, because
16 obviously that's a distinction for the national forest.

17 A Yes.

18 What the model does is it overlays the entire
19 state with this fish net, if you will, of microgrids. Then
20 customers are assigned to microgrids.

21 The next step is to aggregate these customers
22 into serving areas.

23 That's next step of both prongs, customer
24 location, and then form a serving area.

25 What BCPM does is it aggregates together

1 micro-continuous, for the most part continuous microgrids,
2 to form what's called an ultimate grid, which also has a
3 latitude and longitude or degrees dimension.

4 And in a rural area in the interior of a wire
5 center, an ultimate grid will have 64 microgrids in it.

6 So we've got eight tall and eight wide
7 (indicating). This would be your ultimate grid: 1, 2, 3,
8 4; 1, 2, 3, 4 (indicating).

9 And the same this way: 1, 2, 3, 4 (indicating).

10 So an ultimate grid is simply a collection of
11 microgrids. And that is the fundamental serving area in a
12 model.

13 Now what I'm going to do -- What the model does
14 next is it says instead of building plant to the entire
15 area, let's use information on customer locations
16 obtained -- residing within the microgrids to further
17 identify where in this area customers are located. Not all
18 of these microgrids are populated because roads don't go
19 through all the microgrids.

20 So what the model does is it divides this area
21 into quadrants like this based on the road centroid of the
22 ultimate grid (indicating). And by doing so, it identifies
23 whether each of these quadrants is indeed populated.

24 So I'm going to call this quadrant here the upper
25 left quadrant (indicating).

1 And what Mr. Lamoureux is getting at is the
2 following:

3 For the sake of argument, and if I may take this
4 ultimate grid, bring it out here and blow it up so we can
5 look at it.

6 This is the upper left quadrant on their quad
7 over here (indicating). We have got 1, 2, 3, 4; 1, 2, 3, 4
8 (indicating).

9 There's our 16 microgrids in the upper left
10 quadrant. And let's suppose --

11 COMMISSIONER DEASON: Let me interrupt for just a
12 second. Your quadrants, are they always equal in area or
13 are they different depending on where the road center?

14 A Correct.

15 COMMISSIONER DEASON: It's depending on the road
16 center?

17 A Correct.

18 COMMISSIONER GARCIA: Flip that back so we stay
19 with the discussion. Let's put a national park in there.

20 A Okay.

21 COMMISSIONER GARCIA: Let's say part of -- You
22 don't have to put it in the quadrant that you spun out.
23 What is this called, the four together?

24 A This is the ultimate grid.

25 COMMISSIONER GARCIA: Ultimate grid.

1 A The carrier serving area of the model.

2 COMMISSIONER GARCIA: So, in other words, if you
3 put a national park in there somehow or bordering or
4 touching it, how does that affect the shape of the quadrant
5 that you take out?

6 A It doesn't affect the shape.

7 COMMISSIONER GARCIA: Well, you just said that
8 they're not always the same size.

9 A The location of this -- I'm sorry. The location
10 of this point, the cross hairs, is dependent on the road
11 centroid within the ultimate grid.

12 COMMISSIONER GARCIA: In this case it's the
13 centroid within the ultimate grid. And I know that this
14 was gone through at the initial, but this is where the
15 central area of road meet in this ultimate?

16 A Yeah, you can think of it that way, but I
17 think --

18 COMMISSIONER GARCIA: I was looking at a small
19 town.

20 A You would have the roads would be concentrated in
21 that area.

22 COMMISSIONER GARCIA: Main Street would most
23 probably be through there or the state highway or something
24 to that effect, state road?

25 A Yeah, if this was all unpopulated and you had a

1 town right there, yeah, that's where all your roads would
2 be concentrated (indicating).

3 Okay. So a state park somewhere. You know, I --
4 COMMISSIONER GARCIA: It doesn't have to be
5 impregnated.

6 A It doesn't have to be there. You know, I could
7 have a state park boundary doing something like this
8 (indicating) or here's a state park (indicating).

9 Let me do the same thing over here. Let's -- I'm
10 going -- Let's suppose we have a census block like this
11 that kind of incorporates this whole upper left quadrant
12 (indicating). So this is a huge census block. And let's
13 suppose that is inside a state park.

14 What Mr. Lamoureux is getting -- And there are
15 some roads in here. Let me just put a road. Suppose we
16 have got a road traveling through here like this
17 (indicating).

18 Let's suppose that there are people who actually
19 reside right there (indicating). Nobody actually resides
20 over here (indicating).

21 What the model will do is it will take these
22 customers and assign them along this road. And, yes, some
23 assignment may occur there because that microgrid has some
24 share of the road, even though there actually might not be
25 somebody living there. And that is a distinct

1 possibility.

2 The issue that comes to mind, though, is how
3 often that occurs. And, unfortunately, a determination of
4 that is very difficult because we don't have a
5 comprehensive database on that.

6 COMMISSIONER GARCIA: Let's take that example:
7 Wouldn't there be a series of microgrids over the area
8 that you haven't covered? Wouldn't there be another
9 quadrant to the left of that one, correct, or in this case
10 to the west, and there would be two of them to the north?

11 A Right.

12 COMMISSIONER GARCIA: So if that were a state
13 park there that you've shown is a road, road that goes
14 through and drops you at the state park, and there's three
15 people there, what does the model do? It allocates those
16 three people throughout that ultimate grid or does it
17 allocate them along the road so that these two quadrants
18 will be left empty, in essence?

19 A Good. Yes, it would. These are all microgrids
20 again. I can keep drawing. And suppose this is the only
21 road through that area. And there are three customers.

22 COMMISSIONER GARCIA: It's a huge wide area and
23 it's a park and we know that the census block tells us
24 there are three or three households out there.

25 A Yes. The model will then allocate those three

1 households along just this road, leaving everything else
2 empty.

3 So, yes, even though they're actually located
4 here, the model will distribute them along here based on
5 the assumption that people live along roads (indicating).
6 But it won't allocate them over here where they truly
7 don't belong (indicating). This is open space and there is
8 no road. Nobody is going to be allocated there.

9 COMMISSIONER GARCIA: Give me the argument that
10 those who propose the Hatfield will give us about this.
11 I'm sure this question will take us there and it will help
12 me. But can you give me their argument so that I can
13 understand you right here right now. Why is Hatfield
14 better for estimating where these guys are in their theory?

15 A In their theory, well --

16 COMMISSIONER GARCIA: In their theory I'll
17 know -- Well, let me ask you. In their theory I know where
18 one of those three is for sure. If I'm hitting it about
19 70%, I know that in rural areas it's not that specific,
20 but, you know, at 30% in rural areas I know where one of
21 them is.

22 A Okay. Let's take one.

23 COMMISSIONER GARCIA: I can hit one of them in
24 the head? So one of those three I know exactly where they
25 are.

1 A Okay. One of them is -- Okay. We'll take this
2 guy and let's say that we know him geocoded. Okay. So
3 he's assigned to -- for sake of argument -- the right road
4 segment. We don't know where he is from the road. We just
5 got him right on the road.

6 COMMISSIONER GARCIA: You're making the argument
7 that we know where his mailbox is; we don't know where he
8 is? Is that the argument you're making, in geocoding?

9 A We know that -- We know where his address is.
10 What geocoding does is it takes an address and assigns it
11 to a road. So that's the only assignment made. We don't
12 know where he is on the road.

13 COMMISSIONER GARCIA: Okay.

14 A So the Hatfield methodology -- Okay. We've
15 address geocoded one guy. These two guys are then placed
16 uniformally somehow on the boundary of this huge census
17 block (indicating).

18 Where? I have no idea. We don't know what that
19 algorithm is, but they are placed on the boundary of that
20 census block.

21 And then we're faced with, okay, we've got two
22 methodologies that predict customer locations: one that
23 allocates it along the roads and one that uses a
24 combination of address geocoding and surrogate placement,
25 as they call it. Which one does a better job?

1 COMMISSIONER GARCIA: What will that do to the
2 cost of service?

3 A Of doing this (indicating).

4 COMMISSIONER GARCIA: Uh-huh.

5 A Versul?

6 COMMISSIONER GARCIA: Versus yours. Yours would
7 have them along that line, along the road?

8 A I don't know. I don't know.

9 COMMISSIONER GARCIA: All right. I'm sorry. I
10 know I've interrupted your line. I'm sorry.

11 MR. LAMOUREUX: That's okay.

12 A Are we done with this point, Mr. Lamoureux?

13 MR. LAMOUREUX: No, not quite yet.

14 BY MR. LAMOUREUX (Continuing):

15 Q Let me put something up.

16 A I thought I had been very helpful.

17 Q This is a transparency of one of your exhibits,
18 KDD-10. And if I understand what this is, this is the
19 Yankeetown Wire Center. You hired ERIM to do the satellite
20 analysis. And the yellow dots represent where ERIM
21 identified actual customer locations as a result of looking
22 at satellite images; is that right?

23 A That's correct.

24 Q And the numbers inside these squares, those are
25 the numbers of customers that BCPM places in those ultimate

1 grids?

2 A That's correct.

3 Q So, for example, where there's this 10 here, BCPM
4 predicts ten customers in that ultimate grid and then you
5 can count the number of yellow dots to see how many
6 customers ERIM estimated to be in that ultimate grid?

7 A That's correct; uh-huh.

8 COMMISSIONER DEASON: I'm sorry, I've got to
9 interrupt and ask this question. Why don't we just get the
10 satellite for every area and count them and we know where
11 everybody is?

12 A It's expensive.

13 COMMISSIONER DEASON: Well, is it more time
14 consuming than what we're going through here right now
15 arguing this?

16 A Well, I think --

17 COMMISSIONER DEASON: I know you did it for this
18 one area because you wanted to show the accuracy of your
19 prediction. You're saying it is not practical cost wise or
20 time wise to use a satellite and determine where every
21 customer is located? It can't be done or it's just --

22 A No, it can be done.

23 COMMISSIONER DEASON: It's impractical?

24 A To do our analysis, it cost -- To get the
25 satellite observations, it cost \$9,000 for that wire

1 center. If it's \$9,000 per wire center, multiply that by
2 the number of wire centers in the state and you come up
3 with a ballpark figure.

4 COMMISSIONER CLARK: How many wire centers are
5 there in this state?

6 A I was afraid you were going to ask that. I want
7 to say 300 plus. And I'm sure I'll be corrected on that.

8 BY MR. LAMOUREUX (Continuing):

9 Q What I wanted to ask about were just a couple of
10 the ultimate grids on your exhibit. There's an ultimate
11 grid right here (indicating). It's a little hard to see on
12 the overhead. But BCPM identifies one customer in that
13 ultimate grid; right? Right here (indicating)?

14 A (Indicating).

15 Q Right. The satellite imagery shows no customers
16 in that ultimate grid?

17 A That's correct.

18 Q So isn't this an example of an ultimate grid that
19 by your own evidence you say is unpopulated but BCPM
20 populates at least with one customer?

21 A Strictly speaking, that is an example of that
22 possibility; yes.

23 Q And isn't this one up here another example of
24 that where there are no satellite images at all but BCPM
25 places one customer in that ultimate grid (indicating)?

1 A That's correct. And we also need to point out
2 that the data used by BCPM is 1990 census data updated to
3 '95 based on county growth rates. The satellite data is
4 1995 vintage. So -- And that's just the artifact of the
5 models. So there could be a mismatch because of that.

6 Q But you don't know for a fact that that's why
7 BCPM puts one customer there even though the satellite
8 image shows none?

9 A No, I don't know for a fact if that's the case
10 there.

11 Q And, in fact, if BCPM had earlier data than the
12 satellite data, the only way that would occur is if the
13 house was torn down between the BCPM data and the satellite
14 data?

15 A Yeah; not out of the realm of possibility,
16 especially in these rural areas.

17 I need to point out that when I've looked at a
18 correlation between just this, that is, the satellite
19 images per ultimate grid versus the BCPM predicted per
20 ultimate grid, the correlation has been very high. So,
21 yes, we can pick out specific ultimate grids and say, aha,
22 aren't you guys messing up in there.

23 Overall BCPM does very good when you look at a
24 correlation across a large number of ultimate grids.

25 Q Well, let me ask that: Did you do any

1 correlation between numbers of customers as identified by
2 the satellite image and numbers of customers as predicted
3 by BCPM in this Yankeetown Wire Center?

4 A I did not. I can, though.

5 Q And since -- I think what you said before is
6 since there is no satellite image for the other wire
7 centers because it would be pretty expensive, there is no
8 way to predict how many ultimate grids there might be where
9 the satellite imagery shows there is no population but BCPM
10 predicts some population?

11 A That's correct. We simply don't know.

12 Q I guess one further thing on that: And this gets
13 to why I wanted to ask this. Because BCPM identifies at
14 least one customer there, BCPM will build plant to that
15 ultimate grid because there's a customer there to serve
16 that one customer?

17 A Yeah, it will build plant to that ultimate grid.

18 Now another point is that the customer locations
19 identified on that visual are housing units, some of which
20 are occupied, some of which are not.

21 Now if the Commission determines that this is a
22 significant problem with BCPM, that problem might be
23 mitigated by building to households. And that might be an
24 unoccupied housing unit out there. And when you look at
25 just households which are occupied housing units, you might

1 see the frequency of this occurrence diminish.

2 Q Well, did ERIM look for households or housing
3 units?

4 A Housing units.

5 Q Okay. So ERIM identified no housing units in
6 that ultimate grid and BCPM identified one housing unit in
7 that ultimate grid?

8 A Correct. Correct. But ERIM did not know if that
9 housing unit was occupied or not.

10 Q Okay. But you don't know if that's a housing
11 unit or a household; so by switching to a household -- I
12 mean, it could very well be a household?

13 A It could be. It could be.

14 Q So switching to households might -- won't
15 necessarily eliminate that problem?

16 A Not necessarily, unless we went out and checked.

17 Q I want to move off of location and talk about the
18 aggregation process a little bit.

19 A Okay.

20 CHAIRMAN JOHNSON: We're going to --

21 Q Moving off of microgrids to macrogrids.

22 COMMISSIONER JOHNSON: Sir, because you're
23 getting ready to transition here, we're going to go ahead
24 and take a ten-minute break.

25 MR. LAMOUREUX: Sure.

1 (Brief recess.)

2 CHAIRMAN JOHNSON: Let's go back on the record.

3 MR. LAMOUREUX: I've been told I don't speak loud
4 enough. So I'm going to try this.

5 A Before we start, Commissioner Clark asked how
6 many wire centers there were. I was told that BellSouth,
7 GTE, and Sprint have 336, according to the models.

8 Statewide there's over 400.

9 COMMISSIONER CLARK: Thank you.

10 A You're welcome.

11 BY MR. LAMOUREUX (Continuing):

12 Q What I want to do is I want to just continue the
13 discussion a little bit that you started about how you get
14 from microgrids up to ultimate grids and then eventually
15 how you figure out how cable is distributed in service
16 areas. And I want to see if I get this right.

17 Once you've got an ultimate grid, which is
18 comprised of 64 microgrids, then what the model does is it
19 divides the ultimate grid into four quadrants; is that
20 right?

21 A That's correct, for determining the distribution
22 quadrants within that serving area, yes.

23 Q So an ultimate grid is the serving area?

24 A Yes.

25 Q And then what you need to do is figure out how is

1 cable distributed within that serving area?

2 A That's correct.

3 Q So, if this is an ultimate grid, and just to keep
4 it -- And the quadrants are divided up based on the road
5 centroid of the ultimate grid; is that right?

6 A That's correct.

7 Q So just to keep things simple, if the road
8 centroid were actually in the middle of the ultimate grid,
9 the four quadrants would be true squares?

10 A They wouldn't be squares, but they would be
11 equally sized; yes.

12 Q And if the road centroid were somewhere else in
13 the ultimate grid, these quadrants would not all be the
14 same shape?

15 A Correct.

16 Q Okay. Once you've got these four quadrants, then
17 what the model does is it creates an area within the
18 quadrant called a road reduced distribution area; is that
19 right?

20 A That area is created and is used as a modeling
21 tool to estimate backbone and branch and drop cable.

22 Q But it's a model to use to estimate those
23 distances, or feet or whatever, of the branch and backbone
24 cable; is that right?

25 A And drop.

1 Q And drop?

2 A Yeah.

3 Q And, again, the road reduced distribution area is
4 based on the centroid of the quadrant; is that right?

5 A At this point I prefer not to spatially locate
6 the road reduced area. However, the centroid of the road
7 reduced area is at the road reduced -- I'm sorry -- at the
8 road centroid of the quadrant.

9 Q All right.

10 A That's a mouthful.

11 Q Just for illustrative purposes then, if these are
12 the centroids of the quadrant, the centroid of the road
13 reduced distribution area would lay on top of the centroid
14 of the quadrant (indicating)?

15 A Fair enough.

16 Q And all I want to get at is that these road
17 reduced distribution areas within the quadrants within the
18 ultimate grid are the -- are used in the model for modeling
19 purposes to estimate the amount of backbone and branch and
20 drop cables to serve those quadrants within the ultimate
21 grid; is that right?

22 A Yes, to serve -- That is correct; to serve the
23 customers in the microgrids that reside in those quadrants.

24 Q Now in terms of comparing a clustering technique
25 versus a gridding technique for estimating route distance,

1 the FCC has recently said that it considers a model
2 platform that groups customers using a clustering approach
3 because it appears to have advantages over gridding
4 approaches; is that right?

5 A I'm not certain. I have not been closely
6 involved with the FCC. I believe Dr. Brian Staihr would be
7 the better person to direct those type of questions to.

8 Q Have you seen the public notice that the FCC
9 issued on August 7th of this year?

10 A I may have seen it. I don't -- I couldn't recall
11 what exactly is in it.

12 Q Are you aware of a general statement by the FCC
13 favoring clustering approaches over gridding approaches?

14 A I'm aware of a -- I'm aware that the hybrid cost
15 proxy model being proposed by the FCC Staff uses a
16 clustering methodology. It is a different methodology,
17 however, than what is used in the Hatfield Model.

18 Q And the reason the Staff in the hybrid cost proxy
19 model has proposed a clustering approach is they believe
20 the clustering approach has advantages over gridding
21 approaches; would you agree with that?

22 A No, I wouldn't because I don't know specifics as
23 to why they've gone with that methodology.

24 Q Do you think it would be more appropriate for me
25 to ask these questions of Mr. Staihr?

1 A I believe so. He's more intimately involved with
2 that process.

3 Q Okay. Going back to customer location just
4 briefly, if it were possible to get information on actual
5 customer locations for most customers' geocoded locations,
6 do you agree that that would be a preferred way to go?

7 Let me try and ask that again. I'm sorry. I
8 don't think I asked it right.

9 If it were possible to get information on actual
10 customer locations by using geocoded information, would you
11 agree that that would be a preferred way to go?

12 A And by "actuals" we mean geocoding to the street
13 address?

14 Q We'll start with that; sure.

15 A If we had -- So we had a methodology. I'm just
16 thinking out loud.

17 Q Sure.

18 A We have a methodology that -- It's an address
19 geocoding methodology that yields a very high success rate
20 comprehensively in rural areas and in urban areas?

21 Q Yes.

22 A If we had something like that? Well, my
23 inclination would be I would need to look at that very
24 seriously, but that is a tremendous leap from what we have
25 now. But if we had something like that, although it's not

1 perfect and it's not exact, you're not getting the exact
2 location of a house, no, I would say, yeah, we would need
3 to look seriously at it.

4 Q Okay. And all I wanted to get at is all other
5 things being equal, for customer location purposes if you
6 had a geocoded methodology that had a high enough success
7 rate for you, would you agree that that would be the
8 preferred way to go?

9 A Well, I only have a concern with the word
10 "preferred." I would agree that I would need to look at
11 that very seriously. However, I would also want to look at
12 how that methodology stacked up with, say, the BCPM
13 methodology; you know, just to test whether even if you had
14 a high success rate that you could predict more accurately
15 than a less costly way such as that used by BPCM.

16 Q Now in the Hatfield Model, in order to locate the
17 surrogate locations, the ones that cannot be geocoded, the
18 model actually will allow you to place them on interior and
19 boundary roads rather than just on the perimeter of the
20 census blocks?

21 A It does?

22 Q I'm asking. Are you aware that it can do that?

23 A No, I am not aware of that. That is not a user
24 adjustable input as far as I'm concerned.

25 Q So you're not aware that the model could be run

1 using geocoded information for the ones that can be
2 geocoded and placing the remainder customers on interior
3 and boundary roads?

4 A Well, let me take that back. That would have to
5 be done in the preprocessing stage to create a new
6 database. That's something that users certainly cannot
7 do.

8 Q So you're not aware that the model can be run by
9 a user so that the surrogate locations, the ones that
10 cannot be geocoded, rather than being placed on the
11 boundary of the census blocks are placed on the interior
12 and the perimeter roads?

13 A If you're asking whether the user has the option
14 to make that determination when they sit down to run the
15 model, is there an input box that the user can go to and,
16 say, yes, I want to place them on the boundary or interior
17 roads, I am certainly not aware of that option.

18 Q Now in your testimony you refer to an AT&T ex
19 parte presentation where AT&T brought up the possibility of
20 placing surrogate locations on interior and boundary roads;
21 don't you?

22 A Yes, I do.

23 Q So doesn't that suggest to you that it is
24 possible to run the model that way?

25 A Well, we need to be clear here on what we mean by

1 running the model. I mean, when staff sits down to run the
2 model, they take the CD, put it into the machine, the model
3 comes up and as far as I'm concerned and as far as I'm
4 aware there is no option in the drop-down menus that give
5 the user the choice of determining whether the surrogates
6 are placed on the boundary or on the roads.

7 As far as I understand, that has to be done in
8 the preprocessing stage and a new HM5.OMDB file, which is
9 the main database, would have to be generated and provided
10 to the staff in order to do that run.

11 Q Okay. But at least if that were done in the pre-
12 processing, then the model would be run placing the
13 surrogates on interior and boundary roads rather than on
14 the perimeter of the census blocks?

15 A If that was done in preprocessing. I'm assuming
16 they can do that in preprocessing, yes; same way that BCPM
17 could incorporate address geocoded data in the pre-
18 processing.

19 Q Well, if that could be done, then the question of
20 where to place surrogate locations is not really a modeling
21 question; is it? It's more of an input question.

22 A It's more of -- No, it's more of a modeling
23 assumption.

24 Q But if that assumption can be changed and it
25 doesn't change the remainder of the model, then it's not

1 really a modeling question; would you agree with me on
2 that?

3 A No, I think it's a fundamental model assumption.
4 And it's -- It's a far cry from changing the, say the
5 default value for the cost of 200 pair of cable. And we're
6 talking another database, another preprocess database. I
7 mean, I don't consider that an input. I consider that a
8 modeling assumption that goes into the construction of that
9 database.

10 Q I want to go back to the exhibit that I put up on
11 the screen here from your testimony. Now the yellow dots,
12 those are the dots that ERIM identified as actual customer
13 locations based on looking at satellite images; is that
14 right?

15 A That's correct. Those are according to ERIM the
16 location of houses.

17 Q Okay. Can you tell me precisely how ERIM did
18 that?

19 A Precisely?

20 Q Yes.

21 A No, I can't. I'm not an expert in that area. We
22 did file in an interrogatory a description of the process.
23 Generally, though, I can describe what they do.

24 Q Okay. Generally how do they do that?

25 A Generally what they do is they buy a satellite

1 picture. And I believe for this wire center they had to
2 use two satellite pictures to get the whole wire center.
3 They then -- And this picture is digitized so you can bring
4 it up on a computer. And then they correct that image for
5 any distortions that may occur. And, again, I'm stepping
6 out of my league here in terms of what those distortions or
7 what that correction might be.

8 And then they visually inspect each area of that
9 wire center to see if they can see houses.

10 They use census data as a guide as to how many
11 they should expect to find in certain areas. And then they
12 rely on their expertise in viewing these images to
13 determine whether a specific object they see is indeed a
14 house.

15 Q So basically it's some people with some
16 experience looking at a satellite picture and determining
17 from that picture if a structure they see is a house or
18 not?

19 A In a very crude way, yes. I mean, I certainly
20 wouldn't want to tackle this. And the people who do this
21 have considerable experience looking at all types of
22 satellite photography.

23 Q I want to talk about the concentric rings
24 analysis that you mentioned very briefly in your summary.

25 A Yes.

1 Q Now as I understand what you did is you drew
2 these rings around the wire center and you identified where
3 BCPM would -- in what ring BCPM would put a customer in
4 relationship to the cross hairs of those rings; is that
5 generally about right?

6 A Well, it's a little bit more precise than that.
7 What we did is, as Mr. Lamoureux just described, we
8 constructed one-mile-wide concentric rings that emanate
9 from the central office. And you can see that when you
10 overlay those rings on the map of the wire center that show
11 the satellite observations, you can then count up how many
12 actual houses fall within each ring.

13 The next step was to overlay that map on the
14 microgrids in that wire center, which I don't show because
15 it would be a very busy picture. And then count up how
16 many housing units BCPM predicted to occur within each
17 ring.

18 And for each ring, I think there was 13 rings or
19 something like that, compared the counts of the actuals
20 versus the BCPM predicted. And that was the graph that I
21 showed during my summary here today.

22 Q Okay. I want to just try and do an example.
23 Suppose there was a microgrid that fell there (indicating).

24 A You're outside the wire center.

25 Q Uh-oh.

1 A Now you did it. Do you want an erasable pen?

2 Q Thank you. Suppose there was a microgrid that
3 fell here (indicating).

4 A Yes.

5 Q Now BCPM doesn't locate customers in a microgrid.
6 So how did you determine if the customers in this microgrid
7 should be in this ring or this ring?

8 A Well, you're correct. BCPM does not identify
9 where within the microgrid customers are located. So what
10 we did in this case is we simply used the centroid of that
11 microgrid.

12 Q Okay. So if there were ten customers in that
13 microgrid and the centroid of the microgrid were in this
14 lower ring here, you assigned all ten customers of those
15 microgrid to that lower ring?

16 A Yes, we did.

17 Q Effectively that's an assumption that the
18 customers are equally disbursed within that microgrid;
19 isn't it?

20 A No. It's an assumption that the customers are
21 all aggregated at that centroid.

22 Q But if you look at the centroid of the
23 microgrid -- I'm sorry. It's an assumption that the
24 customers are all aggregated at the centroid of the
25 microgrid?

1 A Yes.

2 Q But you know that's not likely to be true; don't
3 you?

4 A Yeah. In reality they're distributed along the
5 roads.

6 Q And the roads in that microgrid could fall in the
7 upper ring or the lower ring?

8 A That's true. That's absolutely true. What we're
9 just trying to do is trying to identify whether given this
10 benchmark does BCPM accurately predict the distribution of
11 customers across the wire center in terms of distance from
12 the wire center.

13 Yeah, there's going to be a little bit of error
14 there on either side, but when you look at the entire wire
15 center BCPM seems to do a very good job of that.

16 Q Using the assumption that customers are equally
17 spaced along the roads in a microgrid, couldn't you
18 allocate customers to rings by spacing them along the roads
19 and then putting them in the appropriate ring where they
20 fall on the road?

21 A You certainly can. We just didn't have --
22 Because BCPM's database isn't that detailed, we didn't have
23 the data readily available to do that type of allocation.

24 Q Okay. And what your analysis will yield is if
25 there are ten customers in this ring, and this ring is nine

1 miles from the wire center, what you did is you summed up
2 all the customers that are in that ring, nine miles from
3 the wire center, and found how many actual customers are
4 nine miles from the wire center. So your analysis yields
5 the relationship between the number of customers at a
6 particular distance from the wire center as found by BCPM
7 and as found by your satellite images?

8 A That's correct; yes.

9 Q So it doesn't actually yield a relationship of
10 spatial points on a map? It yields a relationship of
11 distances from the wire center?

12 A I disagree with that. It yields a spatial
13 distribution of the predicted and actual locations that
14 occur within these one-mile bands. That certainly is a
15 spatial distribution.

16 Q Okay. Well, take an example: All the satellite
17 images in this ring are over here in the ring; right
18 (indicating)?

19 A Correct.

20 Q So they would all be nine miles from the wire
21 center?

22 A Correct.

23 Q If all the BCPM customers were on this side of
24 the ring, spatially they wouldn't be very close to the
25 satellite images, but in terms of distance from the wire

1 center they would be exactly the same distance; wouldn't
2 they?

3 A Yeah, you're absolutely correct. And what I
4 think you're saying is that, gee, maybe we ought to divide
5 that into quadrants maybe and look at the distribution by
6 quadrants.

7 What Mr. Lamoureux is getting at is exactly
8 right. You could have a lot of satellite observations over
9 here, BCPM populated microgrids over here, and you would
10 get the same results based on this simple analysis
11 (indicating).

12 So what that suggests to me is, well, we need to
13 look a little more closely at this wire center. For
14 example, suppose we divide it into quadrants and do the
15 analysis four times; that is, look at the spatial
16 distribution for this northeast quadrant, for the
17 southeast, southwest, and northwest, and see what that
18 gives us.

19 And just so happens I do have that analysis. Let
20 me just quickly put up what the results of that analysis
21 is.

22 The top chart shows the northeast quadrant.
23 Again, we've got the distribution of actuals versus that
24 predicted by BCPM. Again, a very close match. And,
25 indeed, if you look at the correlation between those two,

1 for the northeast quadrant, you get a correlation of .96.

2 Remember, .99 for the whole wire center.

3 If we look at the southeast quadrant; same thing.

4 BCPM distribution and actual distribution matches
5 up very well. Simple correlation is .97.

6 Just to be complete, let's look at the other two
7 quadrants. We see in the southwest quadrant, again, a very
8 close match. Kind of interesting in this quadrant you can
9 see the population drops off after five miles. And if you
10 look at the map, you can see we're out in the water after
11 five miles. So, of course, we would expect the population
12 to drop off.

13 The correlation in the southwest quadrant is .99
14 between predicted and actual.

15 And if we go to the northwest quadrant, the last
16 quadrant, we get the same thing: a very close match
17 between the distribution predicted by BCPM and that
18 actually occurs. Simple correlation is .98.

19 Now Mr. Lamoureux can come back up, which he
20 might. I don't know. But he might come up and say, well,
21 even looking at the quadrants, we've got actuals down
22 here; maybe BCPM puts them up here (indicating). And he'd
23 be right. And what that suggests is we go down another
24 level.

25 Let's divide the wire center up into eighths and

1 do the same thing.

2 I've done that. And the correlations -- I don't
3 have pictures, but I can read the correlations off, just
4 for the record.

5 The first section would be .88; Section 2, .94;
6 Section 3, correlation of 1; Section 4, correlation of .47.
7 Yeah, okay, there's a section where the correlation isn't
8 so high; need to look at that one a little more, see what's
9 going on.

10 Section 5, correlation of 1; Section 6,
11 correlation of .95; Section 7, another correlation of 1;
12 Section 8, correlation of .98.

13 So, Mr. Lamoureux's point is well taken. And,
14 indeed, that is a possibility; So we need to be careful
15 and look more closely as to where within these pie slices,
16 if you will, where customers tend to be actually occurring
17 and where they're predicted to occur by BCPM.

18 Q Just to follow-up a little bit on that, the
19 correlations that you've mentioned, those are correlations
20 of counts of customers at a distance from the wire center;
21 right?

22 A That is a correlation between -- Over the 13
23 rings, it would be the correlation between the count of
24 predicted and the count of actuals that occur within each
25 ring.

1 Q No it's a correlation of -- If you've got for
2 each mile band you've got a number of customers, it's the
3 correlation of that information for ECPM as measured
4 against the satellite images?

5 A It's -- No, it's the correlation between the two
6 counts predicted and actual.

7 Q So if ECPM predicts six customers at three miles
8 and the satellite image predicts four customers at three
9 miles, it's that correlation?

10 A Yes, over all the rings.

11 Q And all I want to get at is it's a correlation of
12 distance, mileage? It's not a correlation of longitude and
13 latitude locations?

14 A Well, no to your first question; yes to your
15 second. It is a correlation between the spatial counts
16 within concentric ring bands over the -- a -- the --
17 rings of the wire center.

18 We don't have latitude and longitude, we have
19 coordinating latitude and longitude, we're --
20 correlating counts within each band and --

21 Q Okay. I want to talk very briefly about the
22 minimum spanning tree.

23 A -- Briefly?

24 Q Relatively.

25 COMMISSIONER LEASON: Before we go any further, let me

1 Q So it's a correlation of -- if you've got for
2 each mile band you've got a number of customers, it's the
3 correlation of that information for BCPM as measured
4 against the satellite images?

5 A It's -- No, it's the correlation between the two
6 counts predicted and actual.

7 Q So if BCPM predicts six customers at three miles
8 and the satellite image predicts four customers at three
9 miles, it's that correlation?

10 A Yes, over all the rings.

11 Q And all I want to get at is it's a correlation of
12 distance, mileage? It's not a correlation of longitude and
13 latitude locations?

14 A Well, no to your first question; yes to your
15 second. It is a correlation between the spatial counts
16 within concentric ring bands over the -- across the 12
17 rings of the wire center.

18 We don't have latitude and longitude. We're not
19 coordinating latitude and longitudes. We're just
20 correlating counts within each band across these 12 bands.

21 Q Okay. I want to talk very briefly about the
22 minimum spanning tree.

23 A Only briefly.

24 Q Relatively.

25 COMMISSIONER DEASON: Before you start, let me

1 ask a question before you do that: Was Yanketown the only
2 wire center you analyzed in this fashion?

3 A It was. And the primary reason was cost. As I
4 mentioned earlier, the satellite imagery for the photos and
5 the production of the satellite geocoded points was \$9,000.

6 It's certainly possible to look at other wire
7 centers. It just would cost roughly the same.

8 I need to point out, though, that that wire
9 center was randomly chosen. What we did is we took -- we
10 randomly selected all of the BellSouth wire centers with
11 density less than 25. And I think that yielded eight
12 counties. I'm sorry. We selected counties that way. That
13 yielded eight counties.

14 And then we, from that selection, selected three
15 at random: Washington, Dixie and Levy. And then the wire
16 center that was chosen for the satellite observation
17 analysis was done solely on the basis of cost. We selected
18 the one, the wire center that was the least costly to
19 analyze.

20 BY MR. LAMOUREUX (Continued):

21 Q Breaking down the concentric rings into quadrants
22 and then into eighths, is that a finer degree of analysis
23 than just doing the concentric rings analysis that is
24 rebuttal testimony?

25 A Is it a finer level of analysis? Yes, it is.

1 ask a question before you do that: Was Yankeetown the only
2 wire center you analyzed in that district?

3 A It was. And the primary reason was cost. As I
4 mentioned earlier, the satellite imagery for the photos and
5 the production of the satellite geocoded points was \$9,000.

6 It's certainly possible to look at other wire
7 centers. It just would cost roughly the same.

8 I need to point out, though, that that wire
9 center was randomly chosen. What we did is we looked -- We
10 randomly selected all of the BellSouth wire centers with
11 density less than 25. And I think that yielded eight
12 counties. I'm sorry. We selected counties that way. That
13 yielded eight counties.

14 And then we, from that selection, selected three
15 at random: Washington, Dixie and Levy. And then the wire
16 center that was chosen for the satellite observation
17 analysis was done solely on the basis of cost. We picked
18 the one, the wire center that was the least costly to
19 analyze.

20 BY MR. LAPOUREUX (Continued):

21 Q Breaking down the concentric rings into quadrants
22 and then into eighths, is that a finer degree of analysis
23 than just doing the concentric rings as you did at your
24 rebuttal testimony?

25 A Is it a finer level of analysis? Yes, it is.

1 Q Why then did you not include the quadrants and
2 the eighths in your rebuttal testimony? Why did you only
3 do the concentric rings?

4 A Primarily it was a decision to make my rebuttal
5 testimony more digestible; trying to consolidate what we
6 put in the testimony to make it more readable. And putting
7 in all this could really bog down a reader.

8 COMMISSIONER DEASON: Excuse me. You picked
9 counties with densities -- To do your random determination,
10 you picked counties with densities of less than 25
11 households per --

12 A Square mile.

13 Let me -- I may have mischaracterized what we
14 did. Let me make sure I got it right. What we did is we
15 took all of the BellSouth counties that fall in that
16 density zone and then randomly selected out of that
17 population three. That yielded Dixie, Levy and
18 Washington.

19 BY MR. LAMOUREUX (Continuing):

20 Q There were only eight counties?

21 A Correct; yes.

22 Q So out of those eight counties, you randomly
23 selected three?

24 A Correct.

25 Q And then you picked the Levy County to do the

1 analysis because to do the analysis on any of the other
2 wire centers would have been a lot more expensive?

3 A I don't know how much more expensive. I'm just
4 told that it was chosen because it was the least expensive.

5 COMMISSIONER DEASON: By the way, I always
6 thought that was pronounced "Levy."

7 MR. LAMOUREUX: I actually knew that. I talked a
8 little too fast.

9 BY MR. LAMOUREUX (Continuing):

10 Q On page 3 of your rebuttal, you refer to the
11 minimum spanning tree analysis as a reality check?

12 A Yes.

13 Q My question is in doing the MST for the Hatfield
14 Model, the way you calculate the MST is to calculate the
15 minimum spanning tree distance for the geocoded locations
16 plus the surrogate locations?

17 A Correct. The minimum spanning tree for the
18 Hatfield Model clusters is the minimum connecting distance
19 that connects the locations within that cluster, which
20 includes the address geocoded as well as the surrogate
21 points.

22 Q And so the MST number that you come up with for
23 those clusters is not in any way -- It's an MST of the
24 Hatfield estimation of customer locations? It's not an MST
25 of in reality in Florida how much distance might be

1 necessary to connect actual customer houses?

2 A I agree. And this is a good point. I'm glad you
3 brought it up. I used the term "reality check" in the
4 testimony. Yeah, it's not really -- We're not using actual
5 locations. So maybe that use of that phrase was a little
6 bit -- I should have used "validation check" would be a
7 better phrase there.

8 And what the MST test is doing -- And it's
9 important we realize what it's doing and what it's not
10 doing. The test is determining whether a model builds at
11 least enough cable to connect customers in the locations
12 identified by the model.

13 Okay. For example, the Hatfield Model locates
14 customers and then forms those customers into clusters,
15 those irregular shaped polygon PNR clusters.

16 What the minimum spanning tree test says is
17 whether or not the model builds enough cable to simply
18 connect customers in those locations identified by the
19 model, not in their actual locations.

20 Used in that way -- and we can't use actual
21 locations because we don't have data on it. That's the
22 whole point. We've got to go with what the models are
23 doing. So are the models internally consistent in this
24 regard?

25 And as I've stated, when we apply that test to

1 both Hatfield and BCPM, we find that BCPM is much more
2 internally consistent than is the Hatfield Model. The
3 Hatfield Model comes up short in 68% of its serving areas.
4 BCPM comes up short in only 24% of its serving areas.
5 Okay. And, again, the question is how does the model --
6 Does the model estimate enough cable distance to simply
7 connect customers in the locations identified by the
8 model?

9 And when we use that definition and the correct
10 counting of cable, we find that BCPM performs, the
11 performance is much superior to that of Hatfield.

12 Q I think you agree with me that the MST analysis
13 is not a comparison of amount of distance in the model
14 versus amount of distance that you might go out and find
15 actually in the real world in Florida?

16 A That is correct. It was never intended to do
17 that.

18 Q Now at Table 9 in your rebuttal testimony where
19 you present the results of your analysis for the Hatfield
20 Model, that table only adds up the Hatfield clusters in
21 which you found a Hatfield distance less than the MST
22 distance; right?

23 A That is correct. Table 9 on page 33 of my
24 rebuttal testimony provides the results of the Hatfield MST
25 analysis in terms of only the main clusters that fall short

1 in terms of their MST.

2 Q Okay. And the percentage of shortage in that
3 table is only a percentage of shortage in those clusters in
4 which you found a shortage?

5 A Absolutely. And this is the only valid way to
6 look at this test. When you look at the analysis performed
7 by Wood and Pitkin, what they're doing is they're saying,
8 okay, there are some shortages but we can offset that with
9 some clusters who builds distribution cable in excess of
10 the minimum spanning tree amount. And that is a completely
11 inappropriate way to do this test.

12 This test is a test of the minimum amount of
13 cable needed to connect customers. You cannot offset that
14 shortage with surpluses, if you will, in the other clusters
15 because we do not know what is the appropriate amount of
16 cable needed to serve those customers. We just know that
17 you need at least the minimum spanning tree amount. So it
18 is a low-end benchmark.

19 The models need to come up to that benchmark.
20 How much higher than the benchmark, we don't know, but at
21 least they need to get up to that benchmark.

22 Q Is the MST comparison an absolute criteria? If
23 you fail the MST, your model is out?

24 A No, it's not, obviously. It's a matter of
25 degree.

1 Q And I just want to -- I think you said this. You
2 did not include in your results any of the clusters in
3 which Hatfield had more than the MST distance?

4 A The data reported in these tables are only for
5 those serving areas for which the MST is greater than the
6 amount of cable estimated by the model for those clusters.

7 Q And that's the same thing for your reporting of
8 your results for BCPM as well; right?

9 A Yes, it is. Yes, it is.

10 Q You don't think it would be information
11 worthwhile having to compare in the entire state whether on
12 the entire state basis Hatfield is over or under versus
13 BCPM being over or under on a composite level?

14 A One -- Are you asking would it be advantageous to
15 look at one figure for each model that counts up both
16 shortages and surpluses and nets out a figure?

17 Q Sure.

18 A No, absolutely not. That is the wrong way to do
19 this test. The test is a test of the minimum amount of
20 cable. You cannot take cable and cluster X and put it in
21 cluster Y if there happens to be too much in this cluster.
22 The model -- You can't do that.

23 Q So because you believe you can't do that, you
24 don't think that's important for the Commission to have?

25 A Absolutely not. I think it obscures the issue.

1 The issue is do the models estimate at least enough cable
2 to connect customers in their locations, that minimum
3 amount. We don't know how much cable should be built for
4 these clusters. We only know that the amount built should
5 be at least enough to connect customers and the model
6 should be brought up to that minimum amount. We don't know
7 how much higher is the appropriate amount.

8 Q What's the purpose of the models in these
9 proceedings, to your knowledge?

10 A To estimate the cost of basic local service in
11 Florida.

12 Q It's not to design a network to serve customers
13 in Florida? You wouldn't use this as an engineering mode?
14 to actually go out and lay plant; right?

15 A I guess that would be a more appropriate question
16 for an engineer. Probably not. Probably not, but that
17 doesn't mean we have to totally abandon what these models
18 are supposed to be doing. I mean, they are supposed to be
19 designing an engineered network, or else why don't we just
20 come up with a cost figure out of the air. Why do we go
21 through all this effort to design a network based on
22 engineering principles and then throw that number out and
23 get rid of that and simply say, well, we can just add up
24 pluses and minuses and we would come out ahead, so we're
25 okay. Why go through all this effort, all this expense if

1 that's all we're going to do.

2 No. What we're doing is we're trying to design
3 an accurate model, a model designed to yield an accurate
4 cost estimate of what it would cost on a forward-looking
5 basis to rebuild essentially the wire base network we have
6 here in Florida. It's an engineering model. Engineering
7 assumptions go into that model. Customer locations goes
8 into that model. We need a certain amount of cable to
9 simply connect customers to each other.

10 If the models can't achieve that minimum
11 benchmark -- and there aren't a lot of quantitative
12 benchmarks we have. If they cannot achieve that, then
13 something has got to be done. We've got to adjust that,
14 something in the model to get those estimations up to that
15 minimum amount.

16 Q The purpose of what the Commission is doing is to
17 calculate the cost of providing service in the State of
18 Florida; is it not?

19 A Yes, based on an engineering model.

20 Q And there have been no determination of how
21 support, once support is arrived at, is going to be
22 targeted or calculated; is there? Could be on a statewide
23 basis; couldn't it?

24 A BellSouth is proposing on a wire center basis. I
25 haven't seen any statewide support proposals.

1 Q Do you have an opinion on whether or not it's
2 appropriate to have the same basis of costs as revenue
3 calculation in terms of geographic units?

4 A I guess I don't have an opinion. I haven't
5 studied that issue.

6 Q At page 36 of your rebuttal, you say there has
7 been no quantification of any offsets in HAI5.0a; right?

8 A That's correct.

9 Q Now that's only because you didn't include the
10 information to be able to provide that quantification?

11 A No, absolutely not. Absolutely not.
12 Quantification of an offset means that we know what the
13 appropriate amount of cable is needed to serve customers in
14 these clusters, not the minimum amount, but some amount
15 above that.

16 If you knew that number, then you can quantify an
17 offset; but just throwing in all clusters for which there
18 is a greater amount than the minimum spanning tree amount,
19 that is not a quantified offset in any stretch of the
20 imagination.

21 Q So when you define -- When you use the word
22 "offset" in this testimony, you meant something more than
23 comparing overages and underages?

24 A Yes, absolutely. What I meant was, again, is --
25 If I can go to the easel.

1 The minimum spanning tree amount is simply the
2 lower end. That is the minimum amount of cable needed to
3 connect customers in a serving area.

4 Now what it would take to actually serve those
5 customers is going to be greater than the minimum spanning
6 tree amount.

7 Why?

8 Well, the minimum spanning tree amount doesn't
9 account for the fact that cable has to go around lakes, go
10 around hills, go around natural obstructions or manmade
11 obstructions.

12 The amount of cable that's actually needed to
13 serve an area is going to be much greater. I don't know
14 how much. It's going to be larger than the minimum
15 spanning tree amount.

16 Now -- And let me just call that "needed."

17 Okay. When I talk about a quantified offset, if
18 we knew what that number is, if we had hard and fast
19 evidence what that number is, and we all agreed on that
20 number, then we can go to each serving area in the model
21 and we say, aha, we've got these clusters that exceed the
22 minimum spanning tree and we can quantify that exceedence.
23 That is how I would use a quantified offset.

24 But what the Hatfield Model proponents are doing
25 is they're saying we don't know what this is either; so

1 let's just take everything above the minimum spanning tree
2 and use that to offset the shortage.

3 And that simply is the wrong way to do it.

4 If we don't know what the needed amount of
5 distance is, then let's just stick with the minimum amount
6 and at least get the models up to there.

7 (Whereupon, the transcript continues in Volume 10
8 without omission.)

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