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REBUTTAL TESTIMONY OF
DON J. WOOD
—ON BEHALF OF AT&T COMMUNICATIONS
OF THE SOUTHERN STATES, INC.
BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION
Docket No. 960847-TP
Filed: September 24, 1996

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Don J. Wood, and my business address is 914 Stream Valley Trail, Alpharetta, Georgia 30202. I provide consulting services to the ratepayers and regulators of telecommunications utilities.

Q. ARE YOU THE SAME DON J. WOOD WHO PRESENTED DIRECT TESTIMONY ON BEHALF OF AT&T IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to the criticisms of the Hatfield Model included in the testimony of Gregory M. Duncan on behalf of GTE Florida Incorporated ("GTEFL"). Because the substance of Dr. Duncan's testimony is his attachment, I will cite to the page numbers in Exhibit GMD-1.

Based on his analysis, Dr. Duncan makes a number of rather sweeping assertions

1 regarding the accuracy and usefulness of the Hatfield Model. The stated foundations
2 for Dr. Duncan's assertions generally fall into one of three categories:

3 1) Dr. Duncan's "straw man" criticisms of limitations inherent in the initial
4 version of the Benchmark Cost Model ("BCM1"). As Dr. Duncan is fully
5 aware, the Hatfield Model presented by AT&T is not based on BCM1, and
6 shortcomings that may occur in the BCM1 model are not present in the
7 Hatfield Model. As a result, many of his criticisms -- whether or not they are
8 valid -- are misleading and simply do not apply to the model being sponsored
9 by AT&T in this proceeding;

10 2) Those criticisms related to Dr. Duncan's apparent desire to revise certain
11 fundamental economic costing principles and to rewrite the FCC's August 8,
12 1996 Order in CC Docket No. 96-98; and

13 3) Criticisms whose underlying premise is simply not valid.

14 I will discuss Dr. Duncan's assertions in some detail below, and explain why each of
15 Dr. Duncan's criticisms of the model is either invalid, unrelated to the fitness of the
16 results of the Hatfield Model to serve as a reliable estimate of the forward-looking
17 economic cost of unbundled network elements, or both.

18
19 *Criticisms based on Dr. Duncan's review of the original version of the Benchmark*
20 *Cost Model -- a cost model that is unrelated to the Hatfield Model as presented by*
21 *AT&T -- and other misstatements regarding how the Hatfield Model works*

22

23 **Q. AT PAGE 1, DR. DUNCAN DESCRIBES THE MODEL AS UNDERGOING**
24 **"CONSTANT CHANGES" AND SUGGESTS THAT SUCH CHANGES**
25 **CALL INTO QUESTION THE RELIABILITY OF THE MODEL. DO YOU**

1 **AGREE?**

2 A. No. Dr. Duncan appears to believe that in order for a cost model to be reliable for
3 use in developing cost estimates, it must be developed in final form and thereafter
4 remain rigid and unchanged. His testimony implies that no additional information
5 should be utilized in developing cost models and no new features should be added.
6 Such an assertion is both baseless and inconsistent with the history of the cost models
7 currently in use by GTEFL. There is certainly no dispute that the Hatfield Model has
8 evolved over time in order to incorporate new data and to include additional features.
9 Because the model is based only on publicly available, non-proprietary inputs, the
10 developers of the model continue their efforts to identify public sources of data. For
11 example, the original version of the model could only be used for universal service
12 calculations.. The second version produced only costs for unbundled elements. The
13 current version can be used for calculations of both universal service and unbundled
14 element costs. Dr. Duncan offers no argument why such model evolution, and the
15 additional information that it makes available, is not desirable. In addition, Dr.
16 Duncan is apparently not aware that the cost models in use by GTEFL's own costing
17 organization have undergone similar changes over time.

18
19 **Q. AT PAGES 9-12, DR. DUNCAN ATTACKS A NUMBER OF**
20 **SHORTCOMINGS OF THE INITIAL VERSION OF THE BENCHMARK**
21 **COST MODEL, AND SUGGESTS THAT THE HATFIELD MODEL**
22 **EXPERIENCES THE SAME LIMITATIONS. IS HE CORRECT?**

23 A. No, and Dr. Duncan is fully aware of this fact. To be clear, Dr. Duncan is correct
24 that three modules of BCM1, jointly developed by US West, NYNEX, Sprint, and
25 MCI, have been adapted to develop loop investments in the Hatfield Model. Dr.

1 Duncan is also correct that a number of legitimate shortcomings have been identified
2 regarding investment calculations in BCM1. As I described in my direct testimony,
3 however -- and as Dr. Duncan later acknowledges -- the Hatfield model incorporates
4 BCMPLUS, which is an updated and corrected version of BCM1, and therefore does
5 not suffer the same shortcomings. Dr. Duncan's description of what he describes as
6 inaccurate "calculations built into BCM," therefore, are both wholly unrelated to the
7 calculations in the Hatfield Model and misleading to this Commission.

8
9 For example, Dr. Duncan states that "for loop plant, both feeder and distribution,
10 BCM1 calculates the investment costs of installation and structures by multiplying
11 the cost of cable by factors." Dr. Duncan goes on to conclude "problems can arise"
12 when this method is used and cable costs change. After making this first of several
13 "guilt by association" claims, Dr. Duncan admits his understanding that the Hatfield
14 Model does *not* use the methodology of BCM1 that he had described. Dr. Duncan
15 states that "Hatfield's BCMPLUS separately estimates the cost of structures, thus
16 potentially overcoming the conceptual flaw in BCM1." While Dr. Duncan continues
17 with his "guilt by association" strategy and describes other shortcomings of BCM1 as
18 if they were flaws in the Hatfield Model, he neglects in all subsequent examples to
19 clarify that he is fully aware that his criticisms apply to BCM1 only, and are
20 unrelated to the Hatfield Model.

21
22 Since to my knowledge no party to this proceeding is advocating the use of BCM1,
23 and since he is fully aware that the Hatfield Model does not utilize the BCM1
24 modules, Dr. Duncan's descriptions of the shortcomings of BCM1 in his testimony
25 are, at best, irrelevant and, at worse, overtly misleading.

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Q. AT PAGE 11, DR. DUNCAN STATES THAT ERRORS IN THE COST ESTIMATION OF DISTRIBUTION PLANT IN LOW DENSITY AREAS OCCUR IN BCM1. ARE THESE ERRORS PRESENT IN THE HATFIELD MODEL PRESENTED BY AT&T IN THIS PROCEEDING?

A. No. At pages 11-12, Dr. Duncan describes a number of purported flaws in BCM1, and concludes that the Hatfield Model is flawed, even though he had previously stated that he is fully aware that the Hatfield Model does not incorporate BCM1. In this section he also begins to use the BCM1 and Hatfield labels loosely and interchangeably, although he knows that these are two separate and distinct models and that criticisms of BCM1 are not applicable to the Hatfield Model as presented by AT&T in this proceeding.

For example, Dr. Duncan is correct that BCM appears to have overstated the amount of distribution cable necessary in low density areas, and understates the amount of distribution cable in high density areas. As I described in my direct testimony, BCMPLUS as incorporated into the Hatfield Model makes the necessary corrections so that the investment associated with distribution plant is correctly reported for each density zone. It is interesting to note, however, that while Dr. Duncan incorrectly argues at length in other sections of his testimony that the Hatfield Model understates the relevant cost, the error in BCM1 regarding distribution investment in low density areas that he describes, if it were incorporated into the Hatfield Model, would result in an *overstatement* of investment and therefore an *overstatement* of reported costs.

Similarly, Dr. Duncan states at page 10 that BCM1 uses "abstract representations" of

1 loop plant. Specifically he points out that feeder plant extends only "from the central
2 office to the edge of the CBG," that "all loop plant within the CBG is assumed to be
3 distribution plant, and that BCM1 assumes that "households are uniformly distributed
4 over the area of the CBG." As Dr. Duncan is well aware, however, the Hatfield
5 Model as presented by AT&T in this proceeding does not assume that feeder plant
6 stops at the edge of the CBG, does not assume that all loop plant within a CBG is
7 distribution plant, and does not assume a uniform distribution of households.

8

9 **Q. AT PAGE 9, DR. DUNCAN STATES THAT THE HATFIELD MODEL**
10 **DEVELOPS COSTS BASED ON AN "EXTREMELY ABSTRACT**
11 **REPRESENTATION OF THE NETWORK -- A FEATURELESS PLAIN."**
12 **IS HE CORRECT?**

13 **A.** Not at all. The Hatfield Model develops investments for facilities and related
14 structure in a "real" world of hills, surface rocks, soil types, bedrock, and water
15 tables. The model incorporates these variables on a highly disaggregated geographic
16 basis, increasing the reliability of the model results. Dr. Duncan's description of a
17 "featureless plain" is simply wrong.

18

19 **Q. AT PAGES 12-14, DR. DUNCAN CRITICIZES WHAT HE REFERS TO AS**
20 **THE HATFIELD MODEL'S USE OF "UNREALISTICALLY HIGH" FILL**
21 **FACTORS. IS HE CORRECT?**

22 **A.** No. I do agree with Dr. Duncan's statement that fill factors determine, in part, the
23 amount of a given investment that is needed and therefore are important to consider
24 when reviewing a cost methodology. I also agree that networks are, or should be,
25 built to operate at less than 100% capacity. Instead, a lower assumed level of

1 utilization, sometimes referred to as "engineering fill" or "administrative fill" is used.
2 The Hatfield Model uses conservative assumptions regarding the "fill" levels
3 associated with plant and equipment. In most cases, the default levels of fill used in
4 the Hatfield Model are lower than the equivalent assumptions made in LEC cost
5 studies that I have reviewed , and in no case are they higher.

6
7 I strenuously disagree, however, with Dr. Duncan's statement at page 12 that "the
8 spare capacity represented by a fill factor less than 1.0 is a *current* economic cost of
9 providing service" (emphasis in original). Such a statement ignores the principle of
10 cost causation, a fundamental principle in the development of economic costs. By
11 characterizing all costs associated with spare capacity as a cost of existing services,
12 Dr. Duncan is effectively giving incumbent LECs an opportunity to deploy the
13 capacity necessary to offer any future competitive services (broadband services, for
14 example) today, and to have this expansion funded by current captive monopoly
15 ratepayers. Costs that will have been *caused* by GTEFL's decision to offer a
16 competitive service in the future will be recovered, if Dr. Duncan's principle is
17 adopted, from the purchasers of existing local exchange services and from new
18 entrants who seek to purchase unbundled network functions. Such an approach is
19 both anti-consumer and anti-competitive on its face and should be rejected. The
20 forward-looking economic cost incurred by GTEFL to provide an unbundled network
21 function includes the cost of the unused portion of the facility operating at
22 "engineering fill" or "administrative fill." However, it does not include an unlimited
23 amount of spare capacity that the incumbent LEC elects to install over Dr. Duncan's
24 proposed "indefinitely long planning horizon" in order to meet its strategic objectives.

25

1 Q. AT PAGES 14-16, DR. DUNCAN ARGUES THAT THE HATFIELD MODEL
2 UNDERSTATES THE COST OF SWITCHING. IS HE CORRECT?

3 A. No. Not only are Dr. Duncan's assertions unsupported by his testimony, they are
4 unsupported by other incumbent LECs. US West and Sprint, two of the four original
5 joint sponsors of the Benchmark Cost Model, have recently released BCM2. Because
6 both of the BCM2 sponsors are incumbent local exchange companies, it is reasonable
7 to assume that BCM2 has been developed from that perspective. In BCM2, US West
8 and Sprint have adjusted the level of switching investment per line to a level that is
9 almost identical to the level used in the Hatfield Model. Put another way, the curve
10 used to approximate the relationship between switching investment and line size
11 criticized by Dr. Duncan at page 15 has effectively been adopted for use by US West
12 and Sprint. At least these two incumbent LECs, therefore, do not agree with his
13 assertion that this curve understates the required level of switching investment.

14

15 Q. AT PAGE 18, DR. DUNCAN ARGUES THAT THE EXPENSES
16 CALCULATED BY THE HATFIELD MODEL ARE UNRELIABLE
17 BECAUSE THEY ARE BASED ON HISTORIC DATA. IS HIS CRITICISM
18 VALID?

19 A. No. In order to create a model that can be fully reviewed and evaluated, the
20 developers of the Hatfield Model have sought to use the best available public data.
21 Where forward-looking sources of expense data have been identified, they have been
22 incorporated into the model. Where no other public source of data is available, it has
23 proven necessary to base forward-looking expenses on the historic levels of expense
24 as reported in ARMIS. Where an objective basis exists to do so, adjustments have
25 been made to this data to reflect the likely magnitude of forward-looking expenses.

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As the FCC explicitly recognized, an "asymmetry of information" exists, and "the incumbent LECs shall have the burden to prove the specific nature and magnitude of these forward-looking costs" (para. 695). The developers of the model have utilized the best available public data that has been identified. If GTEFL believes that the expense levels or any other inputs into the Hatfield Model are not correct, it bears the burden of demonstrating what those inputs should be.

Q. AT PAGES 20-22, 24, AND 27, DR. DUNCAN ASSERTS THAT THE HATFIELD MODEL FAILS HIS PROPOSED CHECK OF "INTERNAL CONSISTENCY." IS HIS CRITICISM VALID?

A. No. Dr. Duncan has once again described what he asserts to be a problem associated with another model, and, after dazzling us with his mathematical prowess and discussing the implications of such a shortcoming, quietly admits that his criticisms may not actually apply to the Hatfield Model as presented by AT&T in this proceeding. Dr. Duncan attempts to demonstrate that a previous version of the Hatfield Model, which was based on BCM1, violates the derivative property. Then, as a result Dr. Duncan declares at page 20 that "the Hatfield Model is not a valid cost model." Yet, Dr. Duncan admits at page 22 that "*to the extent that the Hatfield Model maintained the multiplicative structure of its past versions one should expect the derivative property of cost functions to be violated as well*" (emphasis added). As described previously in my testimony, however, the "multiplicative structure" used to derive the investments associated with outside plant structure (i. e. poles and conduit) that was present in BCM1 and in previous versions of the Hatfield Model has been replaced in the current version of the model. As he acknowledges at page 10, Dr.

1 Duncan was aware of this fact before preparing his testimony.

2

3 It is also noteworthy that while Dr. Duncan readily concludes that the Hatfield Model
4 is not a valid cost model because previous versions of the model are shown to violate
5 the derivative property, at no time does he make the statement "The Hatfield Model
6 (or some previous version of it) violates the derivative property, *in contrast to the*
7 *cost models used by GTEFL*. In fact, at no point in his testimony does Dr. Duncan
8 utilize the methodology used in the cost studies prepared by GTEFL to illustrate the
9 "correct" application of the principles he advocates.

10

11 *Criticisms related to Dr. Duncan's apparent desire to revise certain fundamental*
12 *economic costing principles and to rewrite the FCC's August 8, 1996 Order*

13

14 **Q. AT PAGE 8, DR. DUNCAN ARGUES THAT THE HATFIELD MODEL**
15 **SHOULD NOT BE USED TO DEVELOP "ACTUAL PRICES" BECAUSE IT**
16 **DOES NOT DUPLICATE THE "ACTUAL COSTS" INCURRED BY THE**
17 **INCUMBENT LECS. IS HE CORRECT?**

18 **A.** No. The Hatfield Model calculates the costs that an efficient wholesale provider of
19 unbundled network elements would incur on a forward-looking basis. Consistent with
20 fundamental economic costing principles, the Hatfield Model does not attempt to
21 calculate the costs associated with GTEFL's embedded network, and it does not
22 purport to calculate the level of GTEFL's embedded costs. What Dr. Duncan fails to
23 recognize when making his argument is that no forward-looking cost study, assuming
24 that it is correctly performed, is based on the network configuration and technologies
25 correctly in use. As the FCC clearly points out in its August 8, 1996 Order in CC

1 Docket 96-98, "forward-looking cost methodologies, like TELRIC, are intended to
2 consider the costs that a carrier would incur in the future" (para. 683). Dr. Duncan
3 argues at page 1 that the most efficient forward-looking technology *should be defined*
4 as "the least cost technology *taking the installed network as a base* and building from
5 that." The approach advocated by Dr. Duncan to base forward-looking costs on the
6 installed network, however, has been specifically rejected. *The FCC found that a*
7 methodology that calculates costs "based on existing network design and
8 technology...currently in operation" is "essentially an embedded cost methodology,"
9 and that to establish rates on such a basis would permit the incumbent LECs to
10 recover costs "that reflect inefficient or obsolete network design and technology"
11 (para. 684). In contrast, the Hatfield Model, as Dr. Duncan acknowledges at page 5,
12 calculates forward-looking economic costs in the manner specifically adopted by the
13 FCC, based on "the most efficient technology deployed in the incumbent LEC's
14 current wire center locations" (para. 685). In summary, Dr. Duncan and GTEFL
15 would have this Commission reject the Hatfield Model because it complies with the
16 methodology specified by the FCC rather than with a methodology that was
17 specifically rejected.

18

19 **Q. AT PAGES 17 AND 23, DR. DUNCAN ARGUES THAT THE DEFAULT**
20 **VALUE FOR COST OF MONEY USED IN THE HATFIELD MODEL IS**
21 **TOO LOW AND FAILS TO PROPERLY ACCOUNT FOR THE**
22 **"INCREASED RISKINESS OF AN INDUSTRY MOVING RAPIDLY INTO**
23 **COMPETITION." ARE HIS ASSERTIONS CORRECT?**

24 **A.** No. After considering arguments similar to those made by Dr. Duncan, the FCC
25 elected to provide some guidance regarding an appropriate assumption for cost of

1 capital to be used in forward-looking economic cost studies. Specifically, the FCC
2 found that "based on the current record, we conclude that the currently authorized rate
3 of return at the federal or state level is a reasonable starting point for TELRIC
4 calculations" (para. 702). The Hatfield Model uses a weighted average cost of capital
5 of 10.01%, based on authorized rates of return adopted by the FCC over the 1990-
6 1995 time period. *In doing so, it uses a cost of money assumption that is*
7 *approximately 120 basis points higher than the last authorized weighted average*
8 *cost of capital authorized for GTEFL by this Commission.* In addition, the FCC
9 found that "incumbent LECs bear the burden of demonstrating with specificity that
10 the business risks that they face in providing unbundled network elements and
11 interconnection services would justify a different risk-adjusted cost of capital or
12 depreciation rate. "These elements generally are bottleneck monopoly services that do
13 not now face significant competition" (para. 702). In summary, the Hatfield Model as
14 it has been run for this proceeding uses a higher cost of capital than is required by the
15 FCC Order. If GTEFL continues to assert that the cost of money used in the Hatfield
16 Model "underestimates the real cost of capital," it bears the burden of demonstrating
17 that the risks associated with providing unbundled network elements would require
18 this Commission to sanction the use of a cost of money calculation that is greater than
19 the rate this Commission approved in the recent past.

20

21 **Q. AT PAGES 17 AND 23, DR. DUNCAN ARGUES THAT THE DEFAULT**
22 **VALUES FOR DEPRECIATION USED IN THE HATFIELD MODEL FAIL**
23 **TO TAKE INTO ACCOUNT ECONOMIC LIVES IN A DYNAMIC**
24 **COMPETITIVE ENVIRONMENT. IS HE CORRECT?**

25 **A. No. Dr. Duncan offers no justification for his implicit assumption that an increase in**

1 the level of competition for GTEFL's services will hasten the technical obsolescence
2 of its equipment. His argument once again ignores the language of the FCC Order
3 cited in my previous answer which concludes that unbundled network elements do not
4 face competitive pressures.

5

6 *Other Criticisms raised by Dr. Duncan whose underlying premise is simply not valid*

7

8 **Q. AT PAGE 4, DR. DUNCAN CLAIMS THAT A "MOST VEXING"**
9 **PROBLEM ASSOCIATED WITH THE HATFIELD MODEL IS ITS LACK**
10 **OF WHAT HE REFERS TO AS "EXTERNAL VERIFICATION." IS HIS**
11 **CLAIM VALID?**

12 **A.** Absolutely not. To borrow Dr. Duncan's phrase, his argument regarding external
13 verification of the model "would try the confidence of even the most partisan
14 proponent." Specifically, Dr. Duncan argues in part at page 4 that

15 Ideally, a model such as the Hatfield Model would be calibrated or
16 estimated using cost data from a source similar to those desired or
17 predicted If TS/TELRICs were readily available and
18 observable for a number of firms over time, *then the model would be*
19 *calibrated using all of the data from a subset of the firms,*
20 *presumably a group whose TS/TELRICs we wish to predict ... The*
21 *validity of the model would be judged by comparing the predictions*
22 *of the model with the data obtained in the real world for the firms in*
23 *the validation set using a variety of well known and widely accepted*
24 *criteria (emphasis added).*

25

1 Dr. Duncan's argument compels two observations. First, throughout his testimony
2 Dr. Duncan is quick to refer to the "estimates" generated by Hatfield Model and to
3 contrast these estimates to the "real-data," "real world experience," and "information"
4 purportedly contained in cost studies performed by GTEFL, specifically, and by
5 incumbent LECs, generally. At page 19, for example, Dr. Duncan strains credibility
6 by stating that "Version 2.2 of the Hatfield Model produces *estimates* of network
7 elements costs, based on the abstract representations of network service costs. In
8 contrast, the LECs have *information* on their current forward-looking costs of doing
9 business." Since he has made this statement, it is quite clear that Dr. Duncan has not
10 been involved in the review and scrutiny of the cost studies produced by the
11 incumbent LECs, including GTEFL. As a former Chairman of this Commission has
12 accurately observed, these studies contain "apples, oranges, and a couple of nuts."
13
14 Second, Dr. Duncan is making the incredible assertion that truth is a matter of
15 popular vote. He argues that if a number of incumbent LECs have produced cost
16 estimates for a given unbundled network element that are consistent, and a model such
17 as Hatfield produces costs which differ in magnitude, it is necessary to either reject
18 the Hatfield Model or to "calibrate" it by scaling its results to match the result of the
19 studies performed by the incumbent LECs. In other words, according to Dr. Duncan,
20 once a sufficient number of incumbent LECs have produced cost studies which
21 overstate the costs of supplying unbundled network elements, any attempt (whether it
22 be by a Commission or its Staff, a potential new entrant, or any other party) to
23 objectively and accurately develop costs for these elements must be rejected out of
24 hand, because such an attempt will not overstate costs in a manner consistent with
25 existing cost studies produced by incumbent LECs. If adopted, the principle

1 *advocated by Dr. Duncan would ensure that no entity other than an incumbent LEC*
2 *would ever have the opportunity to produce cost data, because the results of such a*
3 *study must either be rejected or "calibrated" to match the results of the incumbent*
4 *LECs. As a result, the incumbent LECs would be able to freely inflate the costs --*
5 *and therefore prices -- of unbundled network elements and interconnection.*

6

7 **Q. YOU HAVE DESCRIBED THE FCC'S DECISION THAT, BECAUSE OF**
8 **THE OBSERVED ASYMMETRY OF COST DATA, THE INCUMBENT**
9 **LECS BEAR THE BURDEN OF PROVING THE NATURE AND**
10 **MAGNITUDE OF THE FORWARD-LOOKING COSTS THEY SEEK TO**
11 **RECOVER. HAS GTEFL DONE SO IN THIS PROCEEDING?**

12 **A. No. Dr. Duncan has made a number of criticisms which are either baseless or which**
13 **simply do not apply to the Hatfield Model (or both). In addition, he has left**
14 **completely unsupported his single specific claim at page 3 of his testimony that the**
15 **Hatfield Model "understates the cost of loop plant and local switching by about \$6.00**
16 **per line per month." As a result, the Hatfield Model continues to represent the most**
17 **accurate, reliable, and verifiable source of cost information available to the**
18 **Commission to be used to establish rates for unbundled network elements.**

19

20 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

21 **A. Yes.**