

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

RECEIVED

In the Matter of)
Petition of WorldCom, Inc. Pursuant)
To Section 252 (e)(5) of the)
Communications Act for Expedited)
Preemption of the Jurisdiction of the)
Virginia State Corporation Commission)
Regarding Interconnection Disputes)
with Verizon Virginia, Inc., and for)
Expedited Arbitration)

SEP 24 2001

**FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY**

CC Docket No. 00-218

In the Matter of)
Petition of Cox Virginia Telecom, Inc.)
Pursuant to Section 252 (e)(5) of the)
Communications Act for Preemption)
of the Jurisdiction of the Virginia State)
Corporation Commission Regarding)
Interconnection Disputes with Verizon)
Virginia, Inc. and for Arbitration)

CC Docket No. 00-249

In the Matter of)
Petition of AT&T Communications)
Virginia Inc., Pursuant to Section 252 (e)(5))
of the Communications Act for Preemption)
of the Jurisdiction of the Virginia)
Corporate Commission Regarding)
Interconnection Disputes with Verizon)
Virginia, Inc.)

CC Docket No. 00-251

**SURREBUTTAL TESTIMONY OF MICHAEL R. BARANOWSKI
ON BEHALF OF AT&T AND WORLDCOM, INC.**

PUBLIC VERSION

September 21, 2001

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Michael R. Baranowski. I am Managing Director of FTI Klick,
3 Kent & Allen, Inc., a subsidiary of FTI Consulting, Inc. (“FTI/KKA”). FTI/KKA
4 is an economic and financial consulting firm with offices at 66 Canal Center
5 Plaza, Suite 670, Alexandria, Virginia 22314.

6 **Q. ARE YOU THE SAME MICHAEL R. BARANOWSKI WHO SUBMITTED**
7 **REBUTTAL TESTIMONY IN THIS PROCEEDING AS PART OF THE**
8 **AT&T/WORLDCOM PANEL?**

9 A. Yes I am.

10 **Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

11 A. I have been asked by AT&T and WorldCom to review the rebuttal testimony of
12 Verizon witnesses Francis J. Murphy and Timothy J. Tardiff and to identify
13 instances where their criticisms of the FCC Synthesis Model and the UNE
14 Compliant Synthesis Model submitted by AT&T/WorldCom in this proceeding
15 are equally applicable to the recurring cost models submitted by Verizon in this
16 proceeding.

17 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

18 A. In separate rebuttal statements, Messrs. Murphy and Tardiff go to great lengths to
19 identify supposedly fundamental flaws and inconsistencies in both the FCC’s
20 Synthesis Model and the UNE Compliant Synthesis Model submitted by
21 AT&T/WorldCom in this proceeding. Many of those criticisms, including claims
22 that the software is outdated, the model is hard to understand and manipulate, and
23 the outside plant configuration is mismatched with the number of working lines,

1 apply equally to Verizon's own recurring costs models. Thus, any suggestion that
2 these "problems" identified by Messrs. Murphy and Tardiff are reasons for
3 rejecting the UNE Complaint Synthesis Model should be rejected outright.

4

5 **ISSUES RAISED BY MR. MURPHY**

6

7 **Q. MR. MURPHY SUGGESTS THAT EFFORTS TO EVALUATE THE**
8 **SYNTHESIS MODEL WERE HINDERED BY ITS USE OF OUTDATED**
9 **SOFTWARE. DID YOU ENCOUNTER SUCH A PROBLEM WITH**
10 **VERIZON'S MODELS?**

11 A. Yes. The Verizon cost models run on an Oracle software interface. This means
12 that before the models can even be viewed, a licensed version of Oracle must be
13 installed on the computer. However, the models are written and can be run only
14 on a version of the software that is no longer available for purchase. In order to
15 obtain a version of Oracle capable of running the Verizon models, one must first
16 obtain a current version of Oracle and provide proof of such purchase to Verizon.
17 Only then will Verizon provide a compact disk with the appropriate version of
18 Oracle.

19 In addition to the older version of Oracle, Verizon's cost models require that both
20 Microsoft Office 97 and Microsoft Office 2000 be installed on the computer used
21 to run the models.

1 **Q. ONCE THE CORRECT VERSION OF ORACLE IS RECEIVED FROM**
2 **VERIZON, CAN THE VERIZON MODELS BE EFFECTIVELY**
3 **EVALUATED?**

4 A. As explained in the AT&T/WorldCom Panel Rebuttal testimony, the models
5 running under the Oracle interface are cumbersome and difficult to work with.

6 **Q. MR. MURPHY SUGGESTS THAT THE UNE COMPLIANT SYNTHESIS**
7 **MODEL IS FLAWED BECAUSE IT BUILDS OUTSIDE PLANT TO**
8 **ONLY 5,575 DISTRIBUTION AREAS, EVEN THOUGH THERE ARE**
9 **11,500 DISTRIBUTION AREAS IN VERIZON'S EMBEDDED**
10 **NETWORK. IS THIS DISPARITY A FLAW WITH THE SYNTHESIS**
11 **MODEL?**

12 A. Not at all. Mr. Murphy appears to be suggesting that the Synthesis Model is
13 flawed because it does not have as many distribution areas as Verizon's own
14 embedded network in Virginia. This is not a flaw, but rather the result of more
15 efficient groupings of Verizon's existing customer base within the Synthesis
16 Model.

17 As explained in the AT&T/WorldCom Panel testimony, the Verizon outside plant
18 characteristics module relies too much on the embedded network configuration in
19 developing its distributions areas and thus overstates costs. Specifically, Verizon
20 fails to efficiently consolidate distribution areas in its forward-looking network
21 and, instead, includes a large number of distribution areas that serve fewer than 50

1 working lines each.¹ Verizon's cost study makes no attempt to consolidate these
2 distribution areas. Despite these flaws, however, even Verizon's own model does
3 not build outside plant to 11,500 distribution areas. The outside plant
4 characteristics module of the Verizon model builds outside plant facilities to a
5 total of 9,029 distribution areas

6 **Q. MR. MURPHY IS ALSO CRITICAL OF THE UNE COMPLIANT**
7 **SYNTHESIS MODEL BECAUSE IT MODELS A NETWORK IN WHICH**
8 **21 PERCENT OF THE SERVING AREAS EXCEED 600 LIVING UNITS.**
9 **DO ALL OF THE DISTRBUTION AREAS IN VERIZON'S COST MODEL**
10 **INCLUDE FEWER THAN 600 LIVING UNITS?**

11 A. No. Although the inputs to Verizon's cost study do not identify the number of
12 living units within each distribution area, the number of working lines in each
13 distribution area is identified. Of the 9,029 distribution areas included by Verizon
14 in its cost study, 2,000, or approximately 22 percent, contain more than 600
15 working lines. In fact, Verizon's cost study includes over 750 distribution areas
16 with more than 1,000 working lines. The highest number of working lines
17 included by Verizon in a single distribution area is 1,713. Although the number
18 of working lines is not the CSA standard, there are strong indications that
19 Verizon's own cost model violates the Mr. Murphy's standard.

20 **Q. ARE THERE INDICATIONS FROM OTHER INFORMATION**
21 **PRODUCED BY VERIZON THAT VERIZON ITSELF DOES NOT**
22 **ADHERE TO THE 600 LIVING UNIT CSA STANDARD?**

¹ A simple review of the Engineering Survey data shows over 1,300 UAAs with less than 50

1 A. Yes. Verizon provided in response to AT&T/WorldCom discovery a separate
2 database² containing both line counts and addresses served within existing
3 distribution areas. That database identifies at least 231 distribution areas in the
4 Verizon Virginia service territory with more than 600 addresses served. Thus, it
5 appears that Mr. Murphy's standard is regularly violated within Verizon's own
6 network.

7 **Q. MR. MURPHY CLAIMS THAT THE SYNTHESIS MODEL, FILED BY**
8 **AT&T/WORLDCOM INAPPROPRIATELY MIXES INFORMATION**
9 **FROM DIFFERENT VINTAGES, THEREBY DISTORTING THE MODEL**
10 **RESULTS. DOES VERIZON'S COST STUDY MIX DATA FROM**
11 **DIFFERENT VINTAGES?**

12 A. Mr. Murphy is wrong in his characterization of UNE-compliant Synthesis Model.
13 As explained by Mr. Pitkin, the model does not use data of incompatible vintages.
14 By contrast, Verizon's cost models do in fact suffer from this flaw. Because
15 Verizon's cost study is founded primarily on its experience with its embedded
16 network, the inputs to the cost study are taken from a variety of internal sources
17 and often span a number of different historical periods, producing significant data
18 inconsistencies. The most obvious of these is in the development of outside plant
19 costs for the two-wire loop.

20 **Q. PLEASE EXPLAIN.**

21 A. Verizon's outside plant characteristics for its two-wire loop are based directly on
22 a survey conducted by its outside plant engineers in the early to mid-1990's. As

² working lines out of almost 8,800 UAAs.
LEIS0401.mdb.

1 explained in the AT&T/WorldCom Panel testimony, that survey sought
2 information on the feeder and distribution lengths, cable sizes and outside plant
3 structure mix as they existed at the time the survey was conducted. In its cost
4 study, Verizon marries that early vintage survey data with line counts from its
5 April 2000 records, creating a mismatch between the outside plant characteristics
6 and the lines the outside plant can effectively serve. There is no way in the
7 Verizon cost study process to remedy this mismatch without conducting a new
8 engineering survey.

9 **Q. DO THESE TIMING OR VINTAGE DIFFERENCES EXTEND TO**
10 **OTHER AREAS OF VERIZON'S COST STUDY?**

11 A. Yes. For example, Verizon's cable unit prices are based on 1997 through 1999
12 historical cable installations. The operating expenses are based on 1999 historical
13 expenditures. The engineering, furnishing and installation factors are derived
14 from 1998 historical installations. Thus, Verizon uses information covering a
15 wide range of different vintages in its own cost study.

16 **Q. MR. MURPHY CRITICIZES THE SYNTHESIS MODEL FOR ITS**
17 **DEVELOPMENT OF LOOP COSTS ON THE BASIS OF DS0**
18 **EQUIVALENTS. DOES VERIZON'S COST STUDY INCLUDE**
19 **COMPARABLE ASSUMPTIONS?**

20 A. Yes. Verizon's develops of its loop costs for the 2W, DS-1, and DS-3 services
21 relative to the capacity of each service. In other words, Verizon's cost study
22 dedicates a sufficient amount of outside plant facilities to provision each service.
23 In this way, higher capacity services are allocated a proportionately higher share

1 of outside plant investment. For example, Verizon's cost study assumes that DS3
2 service will be provisioned with a minimum of *** **BEGIN PROPRIETARY**
3 **END PROPRIETARY** *** fiber strands. In addition to the fiber themselves, the
4 study allocates pro rata shares of pole and conduit costs to accommodate these
5 additional fibers. As a result, Verizon's DS3 cost bear significantly more outside
6 plant costs than the basic two wire loop.

7 **Q. CAN YOU PROVIDE A SPECIFIC EXAMPLE?**

8 A. Yes.

9 Table 1 compares the equivalent cost per circuit for fiber investment within the
10 Verizon cost study for DS3 and basic two-wire loops.³ *** **BEGIN**

11 **PROPRIETARY**

12

³ Because the Verizon two-wire loop study contains thousands of calculations related to the fiber cost per loop, the costs for the basic two-wire loop in Table 1 are approximate. The fiber cost per two-wire loop reflected Verizon's study is \$8.69, compared with the \$8.75 reflected in Table 1.

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***** END PROPRIETARY** As Table 1 shows, the fiber cost for the DS3 UNE is more than 600 times the fiber cost reflected in Verizon’s two-wire loop UNE. Because other categories of outside plant are provisioned on a pro rata basis with fiber cable, similar relationships exist for pole and conduit investments.

ISSUES RAISED BY DR. TARDIFF

Q. DR. TARDIFF ARGUES THAT THE SYNTHESIS MODEL WAS NOT INTENDED TO COMPUTE THE COST OF UNES. WAS THE VERIZON MODEL DEVELOPED TO COMPUTE THE COST OF UNES?

1 A. As Mr. Pitkin has explained in his own testimony, the design of the Synthesis
2 Model is well suited for generating accurate, TELRIC-compliant estimates of the
3 recurring costs of UNEs. Moreover, if the use of a model can be criticized for
4 departing from the original intent of the model designer, it is the Verizon cost
5 study which is most vulnerable. The Verizon cost study is founded on an
6 engineering survey that was initiated in the early 1990's – well in advance of the
7 Telecommunications Act of 1996. This is also clear from the survey instructions
8 to the survey engineers, which state “The Service Cost organization requires
9 information for loop cost studies to support Line of Business (LOB) tariff filings,
10 product decisions and rate case activities.” The survey was not conducted for the
11 purpose of computing UNE costs.⁴

12 **Q. DR. TARDIFF CLAIMS THAT THE SYNTHESIS MODEL MAKES**
13 **CALCULATION MISTAKES. DOES THE VERIZON COST MODEL**
14 **INCLUDE ANY CALCULATION MISTAKES?**

15 A. Yes it does. The electronic workpapers to the AT&T/WorldCom Panel testimony
16 identify a number of calculation errors within the Verizon cost study that were
17 corrected in the Panel restatement. These errors, which overstated UNE costs,
18 were identified in the workpapers filed with the Panel testimony.⁵

19 **Q. IN HIS DISCUSSION OF THEORETICAL MODEL ISSUES, DR.**
20 **TARDIFF EXPLAINS THAT THE SYNTHESIS MODEL ASSUMES THE**
21 **NETWORK IS “BUILT INSTANTANEOUSLY AND DROPPED INTO**

⁴ Interestingly, the Oracle based cost model used by Verizon in this proceeding has been used in other jurisdictions to compute USF support levels.

⁵ See LCAM Changes.doc in the “Documentation of Changes Folder” of the electronic workpapers filed with Rebuttal testimony.

1 **PLACE AT A SINGLE POINT IN TIME.” DOES VERIZON’S COST**
2 **MODEL MAKE A DIFFERENT ASSUMPTION?**

3 A. Not at all. Verizon’s own cost study assumes that a fully functioning network
4 will be placed instantaneously (in the sense of including all getting started costs)
5 to serve existing demand in Virginia. In other words, the Verizon cost study
6 assumes a total network will be constructed and available to provide telephone
7 services on day one.⁶ Verizon’s cost study differs from AT&T/WCOM’s not in
8 the assumed time for construction and startup of the network, but in Verizon’s
9 perverse assumption that the instantaneously-built network would replicate many
10 of the design features or unit costs of Verizon’s *embedded* network.

11 **Q. DR. TARDIFF EXPANDS ON THIS POINT AT PAGE 16 OF HIS**
12 **REBUTTAL, WHERE HE ASSERTS THAT FIRMS CONTINUALLY**
13 **ADJUST THEIR FACTORS OF PRODUCTION TO AUGMENT AND**
14 **REPLACE FACILTIES. DOES THE VERIZON COST MODEL**
15 **PROVIDE ANYWHERE FOR THE AUGMENTATION AND**
16 **REPLACEMENT OF FACILTIES?**

17 A. No. Verizon’s cost study assumes a network will be placed instantaneously and
18 provides for no future investment to accommodate future shifts in demand as Dr.
19 Tardiff suggests is required.

20 **Q. DR. TARDIFF COMPLAINS THAT IT WAS NECESSARY TO**
21 **DEDICATE A COMPUTER LOADED WITH OBSOLETE SOFTWARE**

⁶ As discussed in the AT&T/Worldcom Panel Testimony, the one exception to the instantaneous network is Verizon’s switch study, which violates TELRIC principles by relying on existing switches and growth-only prices and discounts.

1 **TO RUN THE SYNTHESIS MODEL. DID YOU DO THE SAME FOR**
2 **RUNNING THE VERIZON COST MODELS?**

3 A. Yes. Because of its use of an outdated Oracle application and certain limitations
4 on “access” to various portions of the input and output data, it was necessary for
5 me to dedicate an individual computer loaded with obsolete software to the
6 Verizon models.

7 **Q. DR. TARDIFF CRITICIZES THE SYNTHESIS MODEL’S ASSUMPTION**
8 **OF AN INCREASE IN CUSTOMER LINES AT EXISTING CUSTOMER**
9 **LOCATIONS (TARDIFF AT 33). DOES THE VERIZON MODEL MAKE**
10 **THE SAME ASSUMPTION?**

11 A. Yes. As I explained previously, the Verizon two-wire loop study is based on
12 customer locations from an early to mid-1990’s engineering survey and line
13 counts from April 2001. The April 2001 line counts are greater than the number
14 of lines that were in service at the time the surveys were conducted. Verizon’s
15 own cost study suggests that its own modelers do not take Dr. Tardiff’s supposed
16 concerns about the importance of timing mismatches seriously.

17 **Q. WHAT OVERHEAD FACTOR DID VERIZON USE IN ITS COST**
18 **STUDY?**

19 A. Although Dr. Tardiff criticizes the use of an 8 percent common overhead factor in
20 the Synthesis Model, the Verizon cost study uses a common overhead factor for
21 its recurring cost study of 7.98 percent. As discussed in the AT&T/WorldCom
22 Panel testimony, the Verizon common overhead factor is overstated through the
23 application of a forward-looking to current factor and the failure to adjust

1 expenses to reflect future savings related to merger activity. Compared with a
2 corrected Verizon factor, the 8 percent common overhead used in the Synthesis
3 Model is conservative.

4 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

5 A. Yes.

I, MICHAEL R. BARANOWSKI hereby certify under penalty of perjury that the foregoing surrebuttal testimony is true and accurate to the best of my knowledge and belief.

Signed:

September 21, 2001

Michael R. Baranowski

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CC Docket No. 00-251

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**SURREBUTTAL TESTIMONY OF
CATHERINE E. PITTS
ON BEHALF OF AT&T AND WORLDCOM, INC.**

SEPTEMBER 21, 2001

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

3 A. My name is Catherine E. Pitts. I am a contractor working on behalf of AT&T.
4 My address is 810 Long Drive Road, Summerville, South Carolina.
5

6 **Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?**

7 A. Yes. I filed direct testimony on behalf of AT&T and WorldCom on July 26, 2001
8 and rebuttal testimony on August 27, 2001. My background and qualifications
9 are set forth in my direct testimony.

10 **II. PURPOSE AND SUMMARY OF TESTIMONY**

11 **Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

12 A. AT&T and WorldCom have asked me to respond to Verizon Witness Murphy's
13 rebuttal testimony on Synthesis Model¹ switch module issues.

14 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

15 A. My surrebuttal testimony makes the following points in response to switching-
16 related issues raised by Mr. Murphy:

- 17 • The Synthesis Model uses appropriate switch price inputs.
- 18 • The Synthesis Model reflects the Virginia-specific switch mix.
- 19 • The main distributing frame (MDF) and power investment factor in the Synthesis
20 Model are appropriate and similar to the factor used by Verizon. Even if the
21 factor were increased, it would not cause a significant change in results.
- 22 • Verizon's own data can be used with the Synthesis Model to develop rates (either
23 on a flat rated or traditional port/MOU basis) for ISDN unbundled local switching

¹ This testimony addresses the UNE-compliant Synthesis Model; hereinafter referred to as Synthesis Model.

1 and to assign switch investments to the peak traffic-sensitive and non-traffic
2 sensitive cost categories.

3 **III. THE SYNTHESIS MODEL USES APPROPRIATE SWITCH PRICE**
4 **INPUTS.**

5 **Q. MR. MURPHY QUOTES A 1998 NRRI REPORT² AS SUPPORT FOR**
6 **THE CLAIM THAT THE SYNTHESIS MODEL'S SWITCH PRICE**
7 **INPUTS DO NOT INCLUDE ISDN OR OTHER NEW EQUIPMENT**
8 **ADDED TO SWITCHES SINCE 1983. IS MR. MURPHY CORRECT?**

9 A. No. Mr. Murphy claims that the switch prices are based on switch information
10 dating back to 1983,³ but this is not correct. The FCC's switch price inputs are
11 derived from data between 1992 and 1996⁴ and include the amount of ISDN in the
12 network at that time. The NRRI report states: "During the years covered by this
13 data set, the overwhelmingly majority of the lines were for voice service." That is
14 still the case today; in fact, ISDN lines in Virginia are still less than 2% of total
15 switched lines. In addition, because the Synthesis Model derived the cost of
16 POTS line from a data set that included ISDN lines, it overstated the cost of
17 POTS lines by including the cost of ISDN lines. Mr. Murphy's two-sentence
18 quotation from the NRRI Paper left out the NRRI's critical conclusion:

19
20 "On the other hand, to the extent that the embedded switching
21 investment values include the cost of packet switching, or other
22 non-POTS activities, the data will overstate the cost of providing
23 POTS."⁵

2 ² "Estimating the Cost of Switching and Cables Based on Publicly Available Data, NRRI
98-09, David Gabel and Scott Kennedy, April, 1998, hereinafter "NRRI Paper."

3 ³ Rebuttal Testimony of Francis J. Murphy on Behalf of Verizon Virginia Inc., August 27,
2001, at 47.

4 ⁴ Tenth Report and Order, Appendix C at C-1.

5 ⁵ NRRI Paper at 117.

1 In addition, the FCC's regression formulation included independent variables to
2 account for the unique changes in digital switches over time.⁶ Finally, to the
3 extent the percentage of ISDN in the network has increased, that increase has
4 already been taken into account because the FCC's regression produced switch
5 price inputs that reflect changes in both hardware and software switch technology
6 investment over the relevant time period.

7 **Q. MR. MURPHY STATES THAT THE FCC SYNTHESIS MODEL DOES**
8 **NOT DISCRETELY IDENTIFY SOME UNES.⁷ IS THIS CORRECT?**

9 A. Yes, the Synthesis Model does not separately identify the cost of ISDN ports.⁸
10 This is not, however, a problem. The Synthesis Model's basic port cost can be
11 used as the basis for determining ISDN port costs in the following way:

12 Determine the percentage differences between Verizon's proposed basic
13 port and ISDN ports.

14 Apply these percentages to the Synthesis Model's basic port to derive
15 reasonable estimates of ISDN ports.⁹

16

6 *Id.* at ¶¶. 311-313.

7 Murphy Rebuttal at 48.

8 ISDN ports include the BRI for ISDN lines and PRI for ISDN trunks.

9 Verizon's switch port study at subsection 2.1 shows that BRI port costs are four times higher than a basic POTS port and PRI trunk port costs are 37.7 times higher than a basic POTS port. These percentages could be applied to the basic POTS port results from the Synthesis Model to obtain discrete costs for BRI and PRI ISDN ports.

1 **Q. MR. MURPHY CLAIMS THAT BECAUSE SWITCHING HAS ONLY A**
2 **SMALL IMPACT ON TOTAL USF COSTS, THE FCC'S SWITCH**
3 **MODULE AND SWITCH DATA INPUTS ARE LESS EXACTING AND**
4 **THEREFORE LESS REPRESENTATIVE OF A CARRIER'S**
5 **SWITCHING COSTS.¹⁰ DO YOU AGREE?**

6 A. No. Mr. Murphy leaps to the conclusion that the Commission was somehow
7 cavalier in its treatment of switch costs because those switch costs were less than
8 loop costs in the USF proceeding. This is ridiculous. The FCC conducted a
9 vigorous analysis of switch prices and methodologies for determining those
10 switch prices, and decided after consideration of various proposals to use a
11 methodology based on national values for its switch input prices. For switching,
12 such use of national inputs is perfectly appropriate because these inputs vary little
13 from company to company and area to area and are fairly consistent across
14 companies and regions of the country.¹¹

15 **Q. MR. MURPHY CLAIMS THAT THE SYNTHESIS MODEL'S USAGE**
16 **COST IS NOT STATE-SPECIFIC OR COMPANY-SPECIFIC. HOW DO**
17 **YOU RESPOND?**

18 Contrary to Mr. Murphy's claims, the Synthesis Model produces Virginia-specific
19 switch costs. In his rebuttal, Mr. Murphy misstates the Synthesis Model's
20 methodology.¹² Mr. Murphy's 3-step recitation mixes the FCC's development of
21 switch price inputs with the Synthesis Model's derivation of UNE switch cost
22 calculations. The following accurately describes the Synthesis Model's
23 methodology:

- 24 1. The FCC used switch price data from 1992-1996 from large ILECs'
25 depreciation data and switch purchase data from the Rural Utilities Service

¹⁰ Murphy Rebuttal at 48-49.

¹¹ The NRRI report mentions that the Turner Price Index does not vary between regions of the country for digital switches.

¹² Murphy Rebuttal at 49.

1 in a regression analysis that includes variables to account for changes in
2 digital switches (including changes in price levels and changes in digital
3 switch technologies, etc.). The results of the regression produced a fixed
4 cost for a host or standalone switch, a fixed cost for a remote switch, and a
5 per line cost.

6 2. The Synthesis Model uses the regression results as user-adjustable inputs
7 to the Model.

8 3. The Synthesis Model uses as inputs Virginia specific information about
9 deployment of host, remote and standalone switches¹³ from the LERG,¹⁴
10 Virginia line counts by switch, and Virginia specific switch usage from
11 ARMIS and NECA reports. The switching module applies the FCC's
12 switch price inputs to the Virginia-specific line counts and Verizon's own
13 mix of host and remote switches to calculate Virginia-specific switch
14 costs.

15 4. The switch UNE costs are expressed in two ways: 1) total switch cost per
16 line, or 2) a cost per port and a cost per minute of use. The allocation of
17 switch costs between the port and minute of use cost elements is
18 determined by a user-adjustable input.¹⁵ AT&T/WorldCom's Recurring
19 Cost Panel Rebuttal testimony identified the correct amount of traffic-

¹³ In fact, these costs are conservative because Verizon's embedded mix of host and remote switches are used, even though only the wire center locations are required for purposes of TELRIC. A carrier could undoubtedly redesign its switch network placement of host and remote switches to devise a more efficient configuration on a forward-looking basis.

¹⁴ Telcordia maintains a database of all North American switches that, among other things, classifies each switch as a host, standalone, or remote.

¹⁵ The Synthesis Model filed by Mr. Pitkin used a 30% allocation of switch investment to line ports, with the residual 70% of the switch assigned to the minute of use element.

1 sensitive and non-traffic-sensitive costs based on Verizon's own data.¹⁶

2 The traffic-sensitive costs were then allocated over Virginia-specific
3 usage.¹⁷

4

5 These forward-looking costs are not actual or embedded and are not intended to
6 match Verizon's accounting costs. The Synthesis Model calculates a reasonable
7 forward-looking cost of switching for Virginia.

8 **Q. MR. MURPHY CLAIMS THAT THE MAIN DISTRIBUTING FRAME**
9 **(MDF) AND POWER INVESTMENT FACTOR IS TOO LOW.¹⁸ IS THIS**
10 **A CONCERN?**

11 A. No. An analysis of Verizon's cost study shows that its own power and MDF
12 factors are almost the same as those used in the Synthesis Model. Verizon uses an
13 explicit power factor, but the MDF factor must be computed based on Verizon's
14 SCIS results and MDF-related investment set forth in the "Line Termination
15 Output Reports."¹⁹

¹⁶ Rebuttal Testimony of Michael R. Baranowski, Terry L. Murray, Catherine E. Pitts, Joseph E. Riolo and Steven E. Turner, August 27, 2001, Attachment 5. The Recurring Cost Panel Rebuttal testimony also explains why its calculation of the percent traffic sensitive investment is more appropriate than Verizon's estimate.

¹⁷ Verizon's switch model and the Synthesis Model treat traffic-sensitive and non-traffic-sensitive costs in different ways, requiring that the percent non-traffic-sensitive data from Verizon's model be adjusted before it can be used as an input to the Synthesis Model. Specifically, AT&T/WorldCom's restatement of Verizon's costs assigns the Getting Started and EPHC costs (see Recurring Cost Panel Rebuttal testimony for specifics) to all ports – including trunk ports that are ultimately peak period traffic-sensitive. When using the percent non-traffic-sensitive as an input to the Synthesis Model, it assigns that percentage to line ports only. Therefore the total non-traffic-sensitive investment from Verizon's study must be reduced by the ratio of investment of line ports to total ports. See Proprietary Exhibit 1 for the workpaper associated with calculating this adjustment.

¹⁸ Murphy Rebuttal at 90-91.

¹⁹ See Proprietary Exhibit 1 for the workpapers showing this analysis

1 Even if the Synthesis Model’s MDF and power investments factor were too low,
2 which AT&T and WorldCom dispute, an increase would not have significant
3 impact on costs. The MDF and power investments factor is used in the FCC’s
4 switch price input development process only for switches in the data set from the
5 Rural Utilities Service. The switches in the ILEC depreciation data set already
6 include MDF and power investments. There are only 139 switches (just under
7 13%) in the data set from the RUS, and these switches tend to be smaller than the
8 ILEC switches in the FCC study. As a result, increasing the MDF and power
9 factor would not materially affect the FCC switch price input results.²⁰

10 **IV. THE SYNTHESIS MODEL CAN REASONABLY ASSIGN SWITCH**
11 **COSTS BETWEEN TRAFFIC- SENSITIVE AND NON-TRAFFIC-**
12 **SENSITIVE ELEMENTS.**

13 **Q. MR. MURPHY ARGUES THAT A SIGNIFICANT PORTION OF THE**
14 **SWITCH IS TRAFFIC SENSITIVE.²¹ IS HE CORRECT?**

15 A. No. Mr. Murphy’s description of the operation of a switch is overly simplistic in
16 engineering terms²² and mistaken regarding economic costs. Many of a switch’s
17 functions to process a call request are located in the equipment that serves the
18 port, such as detecting the subscriber lifting the handset and testing the line. Mr.
19 Murphy is correct that the switch performs “a multitude of tasks,”²³ but nowhere
20 does he support the huge leap to his conclusion that these various functions incur

²⁰ The model inputs for MDF and power inputs cannot be changed without causing the MDF and power in the depreciation data set to be double counted.

²¹ Verizon witness Mr. West also purports to rebut my direct testimony concerning the proportion of traffic-sensitive and non-traffic-sensitive costs, but a review of his rebuttal testimony shows that he is actually addressing *rate design*, rather than *cost causation*.

²² Murphy Rebuttal at 52-56. One statement (p. 53) is simply wrong- a switch cannot “bill” a call. It can measure usage, but has no information about tariffs, rates, rate centers, etc. that are required to “bill” a call.

²³ Murphy Rebuttal at 53.

1 discrete costs that are traffic sensitive and should be allocated to the user based on
2 minutes of use.

3 In making his argument, Mr. Murphy is confusing the concept of forward-
4 looking, long-run economic cost causation with what he calls “a fair cost
5 causation manner.”²⁴ Mr. Murphy argues that each call involves *significant*
6 traffic-sensitive costs. This is incorrect. Usage does involve some traffic-
7 sensitive costs, but as was demonstrated in the Recurring Cost Panel Rebuttal
8 Testimony, it is far less of the switch’s cost than Mr. Murphy claims. . Digital
9 switches have a large amount of shared equipment, and this equipment – often
10 called the “getting started equipment” – is needed to process the first call, but can
11 also handle large additional volumes of calls at no additional cost.²⁵ Verizon has
12 conceded that the “getting started costs” associated with this equipment are fixed:
13 “Getting Started costs represent the investments associated with the switch
14 processor and memory, and are considered fixed costs and not vary with
15 additional traffic offered to a switch”.²⁶ As described in detail in the Recurring
16 Cost Panel Rebuttal Testimony, the vast majority of a switch’s cost is not traffic
17 sensitive.

²⁴ *Id.* at 54.

²⁵ For economic cost to be usage based, costs must increase or decrease with usage. For example, ATT/WorldCom have identified parts of a switch whose costs are affected by peak traffic demand. But, a large majority of the switch's costs are not peak traffic sensitive, and Mr. Murphy's methodology for cost allocation is not consistent with economic cost causation principles. There is no incremental economic cost if the use of the component does not cause a change in costs. As described in the Recurring Cost Panel Rebuttal Testimony, the bulk of the costs is driven by ports, and the costs should be assigned according to cost causation.

²⁶ Verizon response to AT&T # 11–39 in Case No. 8879, Maryland UNE Proceeding. Verizon ’s terminating reciprocal compensation rate is **73%** lower than its UNE terminating end office minute of use rate. Verizon has explained its reciprocal compensation rate is lower due to the exclusion of the getting started costs and right to use fees.

1 Mr. Murphy claims that I ignored the fact that the Modified Synthesis
2 Model includes capacity checks for the switch processor’s real time usage and
3 implies that the presence of these capacity checks in the Synthesis Model means
4 that ports are not the primary reason for switch exhaust. Mr. Murphy is mistaken
5 on both counts. I did not “ignore” the process that the Synthesis Model uses to
6 determine when a second switch is required in a wire center; in fact, the Synthesis
7 Model fully supports my conclusions. Deployment of a second switch in a wire
8 center is a relatively rare occurrence due to any type of demand. Moreover, when
9 it does occur, the reason is almost always exhaustion of line capacity, not usage
10 capacity. In the Synthesis Model, only four wire centers in Virginia have more
11 than one switch, and all four reached the maximum number of lines, but none has
12 exceeded the busy hour call attempts or busy hour usage limitations.²⁷

13 **V. THE SYNTHESIS MODEL’S SWITCH NETWORK REFLECTS**
14 **STANDARD SWITCH ENGINEERING PRINCIPLES.**

15 **Q. MR. MURPHY WARNS THAT THE SYNTHESIS MODEL PRODUCES A**
16 **NETWORK ON WHICH CUSTOMERS WOULD FREQUENTLY BE**
17 **DENIED SERVICE. IS THIS TRUE?**

18 A. No. Verizon uses the exact same methodology in reverse to convert its switch
19 traffic peak load costs to annual and monthly costs, using largely the same
20 assumptions, as does the Synthesis Model. Verizon documents this methodology
21 in its study at Part C-8-1 “Busy Hour to Annual Ratio Back-up”. Mr. Turner
22 describes Verizon’s methodology and addresses this issue in more detail.
23

24 **IX. SUMMARY AND CONCLUSION**
25

²⁷ Mr. Murphy did not criticize any of the default capacity limitation in the model.

1 **Q. PLEASE SUMMARIZE YOUR TESTIMONY**

2 A. Contrary to Mr. Murphy's assertions, the Synthesis Model uses appropriate switch
3 price inputs and MDF and power costs. The Synthesis Model reflects the
4 Virginia-specific switch investments and can reasonably assign costs to the port
5 and minute of use elements.

6 **Q. WHAT ARE YOUR CONCLUSIONS?**

7 A. The Synthesis Model's switch module inputs, modeling and results are reasonable
8 and appropriate and should be adopted.

9 **Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?**

10 A. Yes, it does.

I, Catherine E. Pitts, hereby certify under penalty of perjury that the foregoing surrebuttal testimony is true and accurate to the best of my knowledge and belief.

September 20, 2001

Catherine E. Pitts

Catherine E. Pitts