TABLE 4

Outside Plant Facility	Replacement Cost at Current Prices
Poles	3.17
Aerial Cable	1.70
Underground Cable	3.43
Buried Cable	2.12
All Cable	2.13
Conduit	17.29

For telephone poles, at current prices Verizon VA would have to spend over three times as much as the amount assumed by the Modified Synthesis Model. The investment required to reconstruct Verizon VA's OSP facilities is several times higher than what the Modified Synthesis Model produces. Perhaps most informative is the comparison of the different types of cable: the Modified Synthesis Model claims almost 30 percent more customer lines could be connected to the same wire centers at less than half the cost of what it would take to replicate Verizon VA's existing plant. Clearly, the Modified Synthesis Model erroneously assumes that significantly less wire and/or much cheaper wire would be required.

Q. Have you performed other external validity tests?

A. Yes. I compared the distribution distances produced by Modified Synthesis Model for Verizon VA's network in Virginia to the length of a minimum spanning tree ("MST") for the same territory. An MST is a mathematical graph theory construct used to connect a

set of points at the least possible length of total connecting lines.[35] In addition, the MST provides a conservative lower limit for the distribution cable needed to serve a cluster of customers because MST calculates the straightest distance between points (airline miles or Manhattan distance). However, in most instances, telephone plant cannot be placed in straight lines. Rather, cable must be routed around physical obstacles such as rivers, highways, and mountains, and must comply with rights-of-way. Thus, the actual amount of cable (route miles) that would be required to connect customers given the geography of the area is invariably larger than the MST. Because this issue arises in many contexts regarding telecommunication networks, commonly used air-to-route conversion factors have been developed to account for geographic constraints. Airline miles for cable are converted to route miles using conversion factors that have ranged between about 1.3 and 1.6. In fact Bellcore's, BOC Notes on the LEC Network report a route-to-air ratio for the average Bell Operating Company ("BOC") of 1.58.[36] That is, the minimum possible length of cable to serve a group of customers is generally 30 percent or more than the length of the MST due to geographical obstacles.

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[35] *See*, for example, J. E. Flood, ed., *Telecommunication Networks*, IEEE Telecommunication Series 1, Section 13.4, 1977; N. L. Biggs, *Discrete Mathematics*, Clarendon Press, Oxford, 1994. The addition of other points, e.g., drop terminals, can theoretically produce a distance less than the minimum spanning tree. The construct that calculates a MST by allowing extra nodes is known as a Steiner Minimum Tree, which has been shown to reduce the total length of the tree by no more than about 13 percent. In most situations, the difference is much less than 13 percent.

[36] Bellcore, BOC Notes on the LEC Networks (1997) at pgs. 12-18.

Q. What were the results of your distribution length analysis?

A. When compared to an MST distance for the road surrogate customer location set, the Modified Synthesis Model produces overall distribution lengths that are approximately 1.2 times MST. This percentage is well below Bellcore's suggested figure of 1.58. Moreover, 535 clusters of the 5,331 clusters[37], or approximately 10 percent, contain less distribution route distance than the minimum distance necessary to connect all locations. That is, for these clusters the Model estimates less distribution cable than computed by the MST calculation. For 1,314 clusters (23.8 percent), the Model estimates less distribution length than 1.1 times the MST and for 4,011 clusters (75 percent) the Model estimates less than 1.3 times the MST. This clearly demonstrates that the Modified Synthesis Model harbors a serious flaw that yields unrealistic results. Attachment B to this testimony presents the results of this analysis for each cluster produced by the Modified Synthesis Model for Virginia.

Q. What are the economic consequences of the Synthesis Model's understatement of distribution cable?

A. The distribution cable lengths in the Modified Synthesis Model, as in all cost proxy models, have an impact on many outputs beyond the investment cost of the distribution cable itself. Support structures (e.g., poles, manholes, trenches, conduits, pull boxes), maintenance costs, associated power and back up power equipment, and many other

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[37] For the purpose of this study, I have only examined clusters with minimum spanning tree distances of 300 feet or more, thus eliminating clusters where rounding and other smaller inaccuracies cause clusters to produce distribution route mileage shorter than MST distance.

factors are affected by the layout and length of the distribution network. Underestimation of the network length can lead to incorrect UNE prices and hence incorrect price signals for investment and entry for unbundled network elements.

Q. Are there other reasons why the Modified Synthesis Model understates actual investment?

A. Yes. The Modified Synthesis Model systematically understates the investment in OSP by assuming that OSP costs decrease over time. However, because much of the investment in OSP is for "low tech" items such as wire and the associated labor to install it, the costs associated with these parts of the network should be increasing in a forward-looking environment, rather than decreasing (as the case may be for other components that are based primarily on electronics). As I previously noted, WorldCom has stated that loop plant costs are rising over time, in contrast to the assumptions embodied in the Modified Synthesis Model. In fact, this is a position that WorldCom has held for some time. The chief economist at WorldCom observed in 1999:

> The loop is the most essential of all ILEC facilities and also accounts for about one-half of the typical ILEC's rate base. It is highly unlikely that the capitalized value of the loop plant is falling over time....[38]

Despite these pronouncements, AT&T/WorldCom would have this Commission believe, as evidenced by its model's erroneous outputs, that the costs of the loop are

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[38] Michael D. Pelcovits, "Application of Real Options to TELRIC Models: Real Trouble or Red Herring," in James Alleman and Eli Noam, eds., *The New Investment Theory of Real Options and its Implications for Telecommunications Economics,* Boston: Kluwer, 1999.

decreasing dramatically. These claims, however, are belied by WorldCom's earlier statements, as well as by real-world data.

V. INCORRECT METHODOLOGIES, CALCULATIONS AND INPUTS: THE MODIFIED SYNTHESIS MODEL PRODUCES MEANINGLESS OUTPUTS (JDPL ISSUES II-1 TO II-1-C; II-2 TO II-2-C)

Q. How does the Modified Synthesis Model calculate the cost of UNEs other than loop elements?

A. The Modified Synthesis Model uses the components of the Synthesis Model that the Commission adapted from the HAI Model, Release 5.0a.

Q. Do these components produce reasonable costs for the non-loop UNEs?

A. No. First, the Commission made it clear that because the loop was the primary determinant of cost differences for universal service fund ("USF") purposes, precisely estimating the costs of the other components was less important.[39] This approach is analogous to obtaining estimates for the value of a house. If the purpose is to explain differences in value for houses in different areas of a city, it would not be crucial to have a precise estimate of the price of the nails used to construct the houses. However, if the purpose was to pay a fair price for the nails, a good estimate of this component would become much more important. Determining the price of UNEs is analogous to the latter situation. The Synthesis Model however was designed to calculate relative cost

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[39] Fifth Report and Order at ¶ 75.

differences, not the precise cost of any particular component. Thus, any model which incorporates the basic methodologies and assumptions of the Synthesis Model, such as the Modified Synthesis Model, will always be ill-equipped for the purpose of determining the cost of non-loop UNEs.

Q. Besides the fact that the Commission adapted parts of the HAI Model for USF purposes and not UNE calculations, is there another reason why these components produce unreasonable UNE costs?

A. Yes. Even more important is the fact that these components have fundamental calculation errors that produce incorrect cost estimates for end-office switching, tandem switching, and interoffice facilities. In fact, these errors have been detailed by Verizon VA witnesses in recent filings in New York, New Jersey, and Massachusetts. In response to these criticisms, AT&T/WorldCom submitted several new versions of the HAI Model's switching and interoffice module that fundamentally change how the tandem and interoffice costs are calculated. Despite the numerous and significant modifications AT&T/WorldCom made to the Synthesis Model filed here, they failed to correct any of these errors.

A. Switching Costs

Q. Does the Modified Synthesis Model's switching cost function properly estimate Verizon VA's forward-looking switching investment?

A. No, it does not. The Modified Synthesis Model's estimate of switching costs assumes only new switches. Verizon VA's true forward-looking costs, however, will primarily consist of upgrades and growth additions. Verizon VA's cost study filed in this

proceeding conservatively assumes a mix of upgrades, growth additions, and new switches from data provided by its three vendors of switching equipment.

Q. Is the Modified Synthesis Model's exclusion of the costs of switch upgrades and growth switch additions significant?

A. Most definitely. Earlier versions of the switching components of the Modified Synthesis Model relied upon a 1995 McGraw-Hill study, which indicated that add-on switch prices were about 50 percent higher than new switch prices. The study explained that:

> Once a switch supplier sells a new system, it has a nearly captive customer; a telecommunications company can only grow a switch by buying add-on lines from the manufacturer of a switch. Therefore, add-on lines are priced higher than lines on new systems and represent higher marginal sales.[40]

The McGraw-Hill study showed that carriers actually spend about three times more on additions to existing switches than on new switches, and noted that the "gap between additions and new installations will continue to increase as the installed base approaches 100 percent digitization."[41] As the study anticipated, Verizon VA's forward-looking switch costs will primarily include the costs of upgrades and growth switch additions. Verizon VA has no plans of installing new local switches in Virginia. Nevertheless, the Modified Synthesis Model assumes away the higher cost (per-line) of upgrades and additions.

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[40] Northern Business Information, *US Central Office Equipment Market,* p. 72 (McGraw Hill 1994).

[41] *Id.* at p. 61.

1 **Q. Are the Modified Synthesis Model's input assumptions consistent with respect to**
2 **switching costs?**
3 A. No. If the Commission accepts the Modified Synthesis Model's approach and assumes
4 that there are never any growth switches or upgrades, it would need to revise a number of
5 the Modified Synthesis Model's input assumptions in ways that would increase greatly
6 the Modified Synthesis Model's cost estimates. If Verizon VA actually installed switches
7 with no plans to ever purchase additional lines, which is not realistic, the switches would
8 need much more spare capacity than is assumed by the Modified Synthesis Model. For
9 example, if lines were growing at 3 percent annually, and 4 percent capacity is needed for
10 administrative fill, installing a switch with enough capacity for the 17.5-year life assumed
11 by the Modified Synthesis Model would require 70 percent initial spare capacity.
12 Because spare capacity would be substantially increased (on the order of 30 percent over
13 the life of the switch), the initial investment and capital costs would also increase.
14
15 **Q. Are other changes required to make the Modified Synthesis Model internally**
16 **consistent with its switching assumptions?**
17 A. Yes. If the network uses only new equipment as the Modified Synthesis Model assumes,
18 each switch would have to be replaced every few years to allow for growth and
19 technological advances in switching. Accordingly, the depreciation for switches would
20 have to be much higher because the life of the switch would be substantially shorter than
21 assumed by the Modified Synthesis Model. Obviously, this would increase the initial
22 investment and the subsequent capital costs by significant amounts. Replacing a switch
23 every 3 years, rather than every 17.5 years, implies that depreciation is more than 5 times

higher per-year. This also increases annual switch costs by substantial amounts -- the annual switch cost for a three-year life would be about 3.4 times the corresponding factor for a 16-year life.

The only other alternative, under the Modified Synthesis Model's assumption that growth switch and update costs are never incurred, would be to install a new, smaller switch every time Verizon VA experienced enough growth to exhaust existing switch capacity. At a growth rate of about 3 percent per-year, a switch initially installed at the Modified Synthesis Model's assumed utilization rate would need to be either replaced with a larger switch or augmented with a new, smaller switch at the same location in about 3 years. Adding new switches every 3 years to serve line growth and maintain an assumed administrative fill of 94 percent would also increase the cost per-line substantially, even using the Modified Synthesis Model's significantly understated costs for new switches. Of course, the need for floor space, the cost of interconnections between the additional switches, as well as the cost of disrupting the central office, should also be included.

The Modified Synthesis Model inputs are also flawed because, if Verizon VA only deployed new switches and never added growth lines, the manufacturers' discounts would be much smaller (and thus prices would be higher) for new lines. If switch manufacturers could not count on the higher margins they currently receive for growth lines, they would be unwilling to accept the low margins currently earned on initial installations.

Q. Is the Model's treatment of switches the only aspect of the Model that necessitates a higher depreciation rate and cost of capital than provided for by the Model?

A. No, for two reasons. In general, the Model's over-arching assumption that the "efficient firm" is the one that has instantaneously sized its network to "optimally" accommodate current demand levels necessarily implies significantly shorter depreciation lives and a significantly higher cost of capital than are typically experienced in regulated industries. The Model is able to achieve unreasonably low cost estimates in part by failing to factor in these shorter depreciation lives and higher cost of capital implied in its conception of optimization.

In addition, the Model is predicated on the assumption that the optimally configured and sized network that is built today will be again instantaneously and completely replaced every few years when prices are reset with another all new network. This is another reason that the Model requires shorter depreciation lives and a higher cost of capital because a firm becomes substantially constrained by its investment in assets with long lives, many of which become sunk upon deployment. Those investments will be subject to a high risk of being stranded if they are assumed to be replaced every few years by an all new network that is optimally configured using all of the then newest technologies available.

1 These factors arise not only for assets such as switches, which experience
2 relatively high rates of technological progress,[42] but even assets such as OSP facilities,
3 because the hypothetical new firm would make the incumbents formerly "optimal"
4 configuration "inefficient."[43]
5
6 **B. Interoffice Facilities**
7 **Q. Are there deficiencies in the Modified Synthesis Model's calculation of interoffice**
8 **investments?**
9 A. Yes. There are three problems with the Modified Synthesis Model's calculation of
10 interoffice investment. First, as Mr. Murphy explains, the Modified Synthesis Model
11 produces SONET rings used for interoffice transport that are not based on proper
12 engineering practices, and consequently cannot produce costs that approximate the costs
13 of rings in real-world networks. Thus, the Modified Synthesis Model is incapable of
14 calculating accurately the costs Verizon VA will incur in providing transport UNEs to
15 CLECs. Second, the Modified Synthesis Model omits a substantial amount of terminal
16 equipment (add-drop multiplexers ("ADMs"), OC-3 multiplexers, and digital cross-
17 connect systems ("DCSs")) that would be required by even the unrealistic rings assumed

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[42] *See*, for example, Alfred E. Kahn, *Letting Go: Deregulating the Process of Deregulation*, East Lansing: Michigan State University, 1998, pp. 91-92 and Jerry A. Hausman, "Valuing the Effect of Regulation on New Services in Telecommunications," Brookings, 1997. Hausman estimates that annual charge factors based on traditional regulatory depreciation and cost-of-capital can be too low by a factor of two to three.

[43] For example, suppose the luxury of starting from scratch allowed a hypothetical entrant to serve current lines with 20 percent fewer telephone poles than an incumbent. If this were a realistic possibility (which it isn't), then the incumbent's stock of poles would have, in effect, lost 20 percent of its economic value. This type of effect is not captured in the depreciation rates used in the Modified Synthesis Model.

1 by the Modified Synthesis Model. The types of corrections AT&T/WorldCom have
2 made in other proceedings[44] more than quadruple the investment in the electronic
3 terminal equipment in SONET rings,[45] and would increase the investment from $238
4 million derived from the Modified Synthesis Model to about $1,074 million when the
5 corrections are made. Third, Mr. Pitkin's unrealistic line count projection reveals another
6 problem -- the interoffice traffic assumed in his results is over three times that produced
7 by the Commission's Synthesis Model.[46] Further, the configurations of the rings
8 generated by the respective models differ. Thus, just like for loop plant, the Model
9 assumes that an "efficient" carrier accommodates growth by essentially scrapping an
10 existing design and "optimally" configuring its network to new demands.

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[44] Before the New Jersey Board of Public Utilities, Docket No. TO00060356, *Direct Testimony of Robert A. Mercer* (July 28, 2000); Before the New York Public Service Commission, Case 98-C-1357, *Panel Rebuttal Testimony of AT&T Communications of New York, Inc. and WorldCom* (Oct. 19, 2000); Before the Massachusetts Department of Telecommunications and Energy, D.T.E. 01-20, *Direct Testimony of Robert A. Mercer* (May 8, 2001).

[45] The investment in SONET rings includes the electronic terminal equipment and the fiber optic cable and support structures. Terminal equipment accounts for the bulk of this investment -- about 70 percent.

[46] Another indicator of the absurdly high amount of interoffice traffic assumed in Mr. Pitkin's results is the fact that Mr. Pitkin's traffic estimate for Virginia is 25 percent higher than the amount of traffic AT&T/Worldcom last year estimated for Verizon NY -- a territory with three times as many lines as Verizon VA and with some of the largest wire centers in the nation in the New York City area.

1 **C. Expense Factors and Indirect Costs**

2 **1. Plant-Specific Expenses**

3 **Q. How does the Modified Synthesis Model calculate the expenses necessary to operate**
4 **particular types of plant such as digital switches?**

5 A. The Modified Synthesis Model adopts the Synthesis Model's national factors, which
6 represent the national average ratios of current expenses to the book value of plant,
7 expressed in current dollars.

8

9 **Q. Does the Modified Synthesis Model's use of these factors produce reasonable**
10 **estimates of Verizon VA's costs of operating and maintaining its facilities?**

11 A. No, for two reasons: (1) the use of national averages fails to capture Virginia-specific or
12 Verizon-specific operating conditions; and (2) unless there is a close match between the
13 investment levels used to develop the ratios and the investment levels to which the ratios
14 are applied, the application of such ratios without appropriate adjustments will not
15 produce proper results.

16

17 **Q. Why does the Modified Synthesis Model's use of annual factors produce erroneous**
18 **results?**

19 A. Unless annual factors are calculated using proper forward-looking adjustments, and they
20 are applied to proper investment levels, they will necessarily produce erroneous results.
21 Operating expense ratios based solely on historical investment levels can produce
22 particularly poor approximations of forward-looking relationships when those ratios are
23 applied to forward-looking investment levels. Consider, for example, an expense whose
24 costs are unrelated to the underlying technology. As capital equipment becomes more (or

less) productive, the expense-to-capital ratio changes, even though the absolute level of unit expenses would not. Thus, applying an expense-to-capital ratio based on historical investment levels to discounted future investment levels significantly underestimates expenses.

The central office switching example discussed earlier illustrates the potential problems of using annual factors. The Modified Synthesis Model calculates expense ratios on the basis of current expenses to current investments. By applying this ratio to steeply-discounted, forward-looking investments (which the Model generates using the unrealistic assumption that an ILEC can buy all of its switching equipment at the initial, heavily-discounted prices), the Modified Synthesis Model incorrectly assumes that annual forward-looking expenses would be lower as well. Verizon VA's cost studies account for this by making a forward-looking adjustment to its annual cost factors (called the "Forward-Looking to Current" or "FLC" factor). The Modified Synthesis Model makes no such adjustments.

Q. Are there other problems with the Modified Synthesis Model's maintenance factor approach?

A. Yes. The maintenance factor approach used by the Modified Synthesis Model suffers from the same problem as the Model's use of annual factors: it links any decrease in investments with an automatic, proportionate decrease in on-going expenses. For example, if an ILEC, for whatever reason, obtained a discount when purchasing its equipment, the Modified Synthesis Model implies -- counter intuitively -- that the ILEC's

1 future expenses would be lower. Just because someone may buy a new piece of
2 equipment at a discount does not mean the future expenses associated with that
3 equipment will be lower.
4
5 **Q. What particular problems arise when the Synthesis Model uses expense ratios?**
6 A. Conceptually, the Synthesis Model attempts to correct some of the problems I just
7 discussed. The Synthesis Model calculates current expense to current investment ratios,
8 so that it appears to have made a forward-looking adjustment to historical ratios.
9 However, there are two practical problems that make the use of the Synthesis Model's
10 expense ratios problematic. First, the Commission used aggregate data for ILECs, freely
11 admitting that it wanted a national average for USF purposes.[47] Second, although the
12 Commission used data that is based on the prices ILECs pay for equipment, the
13 Commission used nationwide estimates of input costs to calculate the value of current
14 investment. Thus, there is no guarantee that the expense factors will align properly with
15 the equipment price inputs used for the Virginia study. In fact, in the case of switching,
16 there is a clear misalignment, which is evidenced by the underestimation of current
17 switch maintenance expenses by 45 percent, as shown in Table 3B. Again, Mr. Pitkin did
18 not even attempt to fix these problems in the Modified Synthesis Model.

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[47] The Commission clearly distinguished between the use of the Synthesis Model to support the federal USF and its use for other purposes. In fact, it stated that its inputs did not describe any particular company (Tenth Report and Order at ¶ 360), which is markedly different from the objective of a UNE cost study to produce the costs the ILEC actually expects to incur.

1 **2. General Support**

2 **Q. How does the Modified Synthesis Model calculate general support costs?**

3 A. Mr. Pitkin uses the Synthesis Model's calculations of general support cost: the annual
4 capital and operating costs for assets such as land, buildings, motor vehicles, and the like
5 (USOA accounts 2110 and 2120). The Modified Synthesis Model calculates these costs
6 by using ratios of book investment in general support assets to book investment in the
7 plant accounts. These ratios are then multiplied by the total plant investment (investment
8 in network facilities such as switches, wires, and support structures) produced by the
9 Modified Synthesis Model to calculate the support assets. For example, if the book
10 investment in buildings[48] were 5 percent of total plant investment and the Modified
11 Synthesis Model calculated a total network investment of $3 billion, then the Modified
12 Synthesis Model's building investment would be $150 million. Next, this amount is
13 reduced by 32 percent, because the Modified Synthesis Model assumes that the services
14 supported by the USF do not include toll and special access.[49] Finally, the annual costs
15 associated with these investments are calculated by using the depreciation rates, cost of
16 capital and expense factors associated with the support assets.

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[48] The book investment in buildings does not include wire center buildings, which are included in the plant investment in the Modified Synthesis Model.

[49] Tenth Report and Order at ¶ 413.

1 **Q. Do Mr. Pitkin's calculations produce reasonable levels of support assets?**

2 A. No, for three reasons. First and foremost, any approach that calculates one type of cost
3 by applying a ratio to another type of cost depends critically on the validity of the latter
4 cost estimate; the costs derived from the ratio will be biased by the same percentage as
5 any bias in the underlying cost. As I previously explained, the Modified Synthesis Model
6 severely understates the investments required for Verizon VA's network, and therefore
7 automatically underestimates the support assets as well.[50]

8

9 Second, the services excluded by the Commission for USF purposes should not be
10 excluded when calculating UNE costs, because those services (special access and toll) are
11 included in the demand volumes used to size the network, and as such determine the
12 demand for support assets.

13

14 Third, the ratio of the book cost of a support asset to the total network cost is
15 unlikely to be the same as the corresponding ratio of forward-looking costs.[51] For
16 example, the price of central office switches has declined over time (although not as
17 much as the Modified Synthesis Model suggests), but the cost of land and buildings has
18 not. Therefore, any land and building ratio based on book cost would be too low for

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[50] In particular, AT&T/WorldCom's response to data request VZ-VA 55 describes how resources that are needed to upgrade and maintain operating systems databases are captured in the general purpose computer account (one of the general support accounts). Table 3 shows that the Model provides for only about 30 percent of the investment and 5 percent of the expenses that Verizon now incurs for general purpose computers. Therefore, the claim that there are sufficient resources to upgrade and maintain operating systems databases is clearly absurd.

[51] The Commission conceded that the Synthesis Model had this conceptual error, but chose not to fix it on practical grounds. Tenth Report and Order at ¶ 415.

calculating forward-looking costs if the ratio is applied to discounted, forward-looking switch investments and, consequently, would underestimate the required investment in land and buildings. In fact, I estimate that the average ratio of support assets to network assets based on current costs is 18 percent higher than the average ratio based on book costs.[52]

Q. What is the overall impact of these flaws in Mr. Pitkin's general support calculations?

A. If the Modified Synthesis Model produced a reasonable level of plant investment (which it does not), general support costs would be underestimated by about 43 percent.[53] This is the result of erroneously applying the Commission's USF reduction to UNE costs and not recognizing that the support ratios based on current costs are higher. Of course, this impact is magnified by the Modified Synthesis Model's substantial understatement of forward-looking plant investment.

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[52] My calculation uses the current cost to book cost ratios reported in Appendix D of the Tenth Report and Order.

[53] The correct ratio of support-to-network assets is 18 percent higher. In contrast, Mr. Pitkin has effectively reduced this ratio by 32 percent by erroneously applying the Commission's USF reduction. Thus, Mr. Pitkin's adjustment relative to the correct adjustment is 0.68/1.18 = 0.57

1 **3. Network Operations**

2 **Q. How does the Modified Synthesis Model estimate the amount of network operations**
3 **costs needed to provide UNEs?**

4 A. The calculations that assign network operations expenses to specific UNEs are
5 convoluted and obscure.[54] They appear to be assigning an estimated total of about $106
6 million[55] for the year 2002 to individual UNEs. However, the calculations apparently are
7 not operating as intended, because only about $81 million of these expenses are included
8 in the UNE costs.[56]

9

10 **Q. Why does the Modified Synthesis Model "lose" some expenses?**

11 A. Undoubtedly, there are errors in (1) the process by which AT&T/WorldCom first
12 translate total expenditures into "hard-wired" numbers they insert into the Model that are
13 used to assign the total amount to individual elements, and (2) the formulas in the
14 complicated worksheets that Mr. Pitkin has added to the Model. This former process

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[54] In response to data request VZ-VA 7, AT&T/WorldCom refer to a specific worksheet they have added to the Model, which in turn draws on calculations in another worksheet they added. These worksheets are large ("Per Line Allocation" is 184 rows by 50 columns and "Direct Expenses" is 57 rows by 12 columns) with numerous calculations that purport to assign total network operations expenses to the individual UNEs. These complex calculations are inconsistent with Mr. Pitkin's description on page 16, "The most straightforward way to accomplish this is to allocate total common support expenses to individual UNEs based on each UNEs proportion of direct costs."

[55] Before the Federal Communications Commission, CC Docket Nos. 00-251, -249, -251, *Cost Studies and Supporting Documentation Setting Forth Cost Model Outputs for Unbundled Network Elements and Associated Non-Recurring Charges Submitted by AT&T Communications of Virginia, Inc. and WorldCom, Inc. Volume I* (July 2, 2001) at Attachment E ("AT&T/WorldCom Cost Model Documentation").

[56] The Modified Synthesis Model includes a UNE/USF switch in the "Per Line Allocation" worksheet, the effect of which is to set the network operations expenses to zero. This produces a difference of about $94 million in total element annual cost ("Unit cost" worksheet, cell C97), which then is adjusted to remove corporate overheads, other taxes, and uncollectibles.

appears to be the result of applying a Commission regression equation intended to isolate at a national level expenses assignable to basic service.

Q. What is wrong with this assignment method?

A. It appears to be seeking a level of detail that is simply not attainable from the information at hand, and in the process, errors have been introduced. The Model's calculations are constrained by the information AT&T/WorldCom has available. The Commission's regression, developed from national 1998 data, was intended to separate network operations expenses deemed to be caused by basic exchange service from expenses that the Commission attributed to special access and toll services. AT&T/WorldCom tries to use the Commission's attempt at "rough justice" to fine-tune assignments to individual UNEs. Indeed, the Model includes 84 separate assignments of overall network operations expenses.[57]

Q. Aside from the error in assigning the total amount of network operations expenses, does the Model start with the right total?

A. No. AT&T/WorldCom starts with a total cost of $1.27 per line.[58] While AT&T/WorldCom's total expenses are close to what Verizon VA currently incurs ($110

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[57] The Model assigns expenses to 28 categories (or subcategories) of UNEs and AT&T/WorldCom attempt to sort expenses into three categories: those caused by switched lines, special access line, and toll, respectively. AT&T/WorldCom Cost Model Documentation at Attachment E.

[58] Based on 2000 ARMIS data, Verizon VA's current network operations expense per-line is $1.78 when special access lines are counted as voice-grade equivalents and $2.41 when special access lines are counted on a facilities basis. The latter amount is similar to the $2.51 per physical loop for 1998, indicating that AT&T's large reduction is primarily an artifact of the large assumed growth in special access. AT&T/WorldCom's figure is much

1 million versus $106 million), in assigning these expenses to loops and other elements, the
2 Model divides these expenses by a speculative, unrealistically large projection of lines for
3 the year 2002. Because loop costs are calculated by adding a portion of this per-line
4 expense to the other cost components for loop elements, the unrealistically low starting
5 point ends up producing artificially low estimates of loop costs.
6
7 **4. Corporate Overheads**
8 **Q. How does the Modified Synthesis Model calculate corporate overhead expenses?**
9 A. The Modified Synthesis Model applies an overhead factor of 8 percent to all of the other
10 costs calculated by the Model. The results of this calculation are shown in Table 3B.
11 While Verizon VA incurred corporate expenses (USOA accounts 6710 and 6720) of
12 about $148 million in 2000, the Model produces less than one-third of that amount or $45
13 million.[59]
14
15 **Q. Why does the Modified Synthesis Model drastically reduce these overhead**
16 **expenses?**
17 A. There are two fundamental flaws that explain the Modified Synthesis Model's artificially
18 low cost results. First, the Modified Synthesis Model calculates the factor based on the
19 ratio of overhead costs to all other costs, but then applies the overhead factor to its

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lower than the $2.04 per-line figure that AT&T offered as representing "best practices" in the concurrent UNE proceeding in Massachusetts. AT&T/ WorldCom Cost Model Documentation at Attachment E.

[59] Indeed, the $45 million produced by the Modified Synthesis Model is well under one-half of Mr. Pitkin's own projections of Verizon VA's corporate overhead expenses. AT&T/WorldCom Cost Model Documentation at Attachment E.

estimate of all other forward-looking costs. As Table 3 shows, those estimates are well under half of what Verizon VA needs to run its current network, and the resulting overhead cost estimate likewise understates forward-looking overhead expenses. This illustrates the general problem with expense factors. Namely, if hypothetically the cost of all network components were reduced by 50 percent, there is no reason to expect that only half of the current professional workforce would be required to manage that network. Second, as described in Mr. Murphy's testimony, the 8 percent factor itself is too low, even when applied to proper forward-looking investment levels.

VI. CONCLUSION (JDPL ISSUES II-1 TO II-1-C; II-2 TO II-2-C)

Q. Please summarize your assessment of the Modified Synthesis Model.

A. The Modified Synthesis Model should not be used to set UNE rates in Virginia, or any other state. The Model does not comply with proper forward-looking cost methodologies, has never been validated, and significantly distorts the engineering of a local exchange network. Numerous errors are built into the Modified Synthesis Model's estimating methodologies and input assumptions, which result in a significant understatement of the forward-looking costs required to provide reliable service in Virginia. For the foregoing reasons, and the others discussed in Mr. Murphy's testimony, the Commission should not utilize the Modified Synthesis Model, in any manner, to establish Verizon VA's UNE rates.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Declaration of Timothy Tardiff

I declare under penalty of perjury that the foregoing is true and correct. Executed this 23rd day of August , 2001.

Timothy Tardiff