BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Review of Unbundled Loop and Switching Rates; the Deaveraged Zone Rate Structure; and Unbundled Network Elements, Transport, and Termination	))))))	**DOCKET NO. UT-023003**

INITIAL POST-HEARING BRIEF OF VERIZON NORTHWEST INC.

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OPENING POST-HEARING BRIEF OF VERIZON NORTHWEST INC.

Pursuant to the Commission's orders,[1/] Verizon Northwest Inc. ("Verizon NW") respectfully submits this opening post-hearing brief addressing the issues identified in the parties' outline as modified by the Commission.

I. INTRODUCTION AND EXPLANATION OF TELRIC PRINCIPLES

The Commission initiated this proceeding "to review UNE rates that may be set either too high or too low based on their direct costs."[2/] Properly set, UNE rates will encourage the development of efficient local telephone competition in Washington. Set too low, however, UNE rates "can thwart one of the central purposes of the [Telecommunications] Act [of] 1996: the promotion of facilities-based competition."[3/]

[1/] Twentieth Supplemental Order, Docket No. UT-023003 (issued Mar. 11, 2004) ("*Twentieth Supplemental Order*"); Notice of Modification of Briefing Schedule, Docket No. UT-023003 (issued June 7, 2004).

[2/] Third Supplemental Order, Docket No. UT-023003, ¶ 11 (issued Aug. 13, 2002) ("*Third Supplemental Order*").

[3/] Notice of Proposed Rulemaking, *Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, 18 FCC Rcd 18945, ¶ 3 (2003) ("*TELRIC NPRM*").

The Commission has defined the scope of this proceeding "on an element-by-element basis,"[4] as refined most recently in April 2004.[5] It has limited this docket to consideration of recurring costs, and established a new docket to address nonrecurring costs at a later date.[6] The only parties that proffered witness testimony at the hearings in this docket were Verizon NW and AT&T Communications of the Pacific Northwest, Inc. ("AT&T"), together with Commission Staff ("Staff").[7] No other CLECs participated in the cross-examination of witnesses.

Verizon NW has submitted a new cost model in this proceeding, VzCost, together with new inputs and assumptions. As shown below, this new Internet-based model and its associated cost studies (1) address the criticisms leveled by the Commission against all cost study proponents in its original generic cost docket, No. UT-960369 *et seq.*, and (2) conform to the TELRIC rules, including recent FCC guidelines governing UNE pricing determinations by state regulatory commissions. VzCost and its key inputs and assumptions are an appropriate basis for estimating the real-world, forward-looking costs of providing UNEs. In addition, VzLoop — the loop module for VzCost — relies on an unprecedented collection of plant records, designed to ensure that the model takes adequate account of both the constraints of the real world (such as bodies of water and zoning requirements) and the efficiencies of existing rights-of-way. VzCost begins with these real-world data, but then adjusts them in significant ways to ensure that the

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[4] *Id.*

[5] *See* Twenty-first Supplemental Order, Docket No. UT-023003, Appendix B (issued Apr. 6, 2004); Erratum, Docket No. UT-023003 (issued Apr. 13, 2004).

[6] *See* Twelfth Supplemental Order, Docket No. UT-023003 (issued Aug. 5, 2003). The Commission has approved a settlement with respect to UNE rates for Qwest Corp., so that the only remaining issues concern the recurring UNE rates applicable to Verizon NW. *See* Twenty-second Supplemental Order, Docket No. UT-023003 (issued May 11, 2004).

[7] The testimony of Mr. Donovan pre-filed in June 2003 by AT&T was also filed on behalf of WorldCom, Inc. and XO Washington, Inc. *See* Exh. No. 951T. However, that testimony was ultimately sponsored by Mr. Fassett, who appeared only on behalf of AT&T. *See id.*

investments and expenses relied upon in its cost studies are forward-looking and rely on the most efficient technologies that are currently available.

In contrast, the cost model sponsored by AT&T, HM 5.3, is incapable of accurately estimating Verizon NW's forward-looking costs of providing UNEs. In terms of its ability to produce valid economic costs, it does not differ fundamentally from previous versions of the same model that the Commission has declined to adopt. HM 5.3 still relies upon a set of unrealistic and hypothetical assumptions that are often supported by nothing more than the opinion of AT&T's consultants or Taylor Nelson Sofres ("TNS"), the developer hired by AT&T. Using the TNS cluster input database, whose source code AT&T never provided in this case despite having been ordered to do so, HM 5.3 discards Verizon NW's actual customer locations and ignores the foregoing real-world obstacles. AT&T's principal witness, Dr. Mercer, concedes that an ideal model should account for such factors.[8/] But in order to avoid the "complexity" of dealing with actual locations,[9/] HM 5.3 models plant to clusters of hypothetical customer locations that are uniformly distributed within rectangular-shaped distribution areas.[10/] Indeed, many of these inputs are identical to those about which the Commission has previously expressed concern.[11/]

[8/] Tr. 1611:12-1612:22, (Mercer). On redirect examination, Dr. Mercer attempted to qualify this concession by limiting the importance of considering rights-of-way to "a case where I did want to run where there was a right of way." Tr. 1664:19-20. As noted below, however, a major defect of HM 5.3 is that *in no case* does it account for existing rights-of-way or natural or man-made obstacles, nor the costs associated with obtaining such rights-of-way.

[9/] Tr. 1599:1-2, (Mercer).

[10/] Exh. No. 601T 6:11-14, (Dippon); Exh. No. 503T 2:11-13, (Tardiff); Exh. No. 451T 5:13-16, (Richter).

[11/] Exh. No. 501T 96:8-11, (Tardiff); *see also* Eighth Supplemental Order, Docket Nos. UT-960369, -960370, -960371 (issued Apr. 16, 1998), ¶¶ 93, 134, 285 ("*Eighth Supplemental Order*").

A. TELRIC Principles Established by the FCC

The TELRIC principles as outlined by the FCC seek to establish UNE rates based upon "forward-looking economic costs," and not "embedded costs," so as to "simulat[e] the conditions in a competitive marketplace."[12/] Under the FCC's rules, forward-looking costs include the most efficient technology that is "currently available."[13/]

Thus, for each UNE, the price should include the forward-looking costs that "can be attributed directly to the provision of services using that element." This price should include "a reasonable return on investment," plus "a reasonable share of the forward-looking joint and common costs."[14/] For the former, the FCC has relied on the "forward-looking cost of capital;"[15/] for the latter, it has found "a percentage markup over the directly attributable forward-looking costs" to be a "reasonable" methodology.[16/] Costs shared between elements — such as for "conduits shared by both transport and local loops" — may be attributed based on an assessment of "reasonable proportions."[17/] The FCC has made clear that TELRIC is designed to estimate the

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12/ First Report and Order, *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, 11 FCC Rcd 15499, ¶¶ 620, 679 (1996) ("*Local Competition Order*"). In its Seventeenth Supplemental Order, the Commission noted that "the FCC's pricing methodology and rules are currently binding on this Commission." Seventeenth Supplemental Order, Docket Nos. UT-960369, -960370, -960371 (Sept. 28, 1999), ¶ 168.

13/ *Local Competition Order*, ¶ 690; 47 C.F.R. § 51.505(b)(1); *see also TELRIC NPRM*, ¶ 49 (*citing Local Competition Order*, ¶ 685).

14/ *Local Competition Order*, ¶ 673; 47 C.F.R. §§ 51.505(c)(1), (2).

15/ As noted below, the FCC has recently determined in its *Triennial Review Order* that states should establish a cost of capital "that reflects the competitive risks associated with participating in the type of market that TELRIC assumes" and that "reflect[s] any unique risks . . . associated with new services that might be provided over certain types of facilities." Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *Review of the Section 251 Obligations of Incumbent Local Exchange Carriers*, 18 FCC Rcd 16978, ¶ 683 (2003) ("*Triennial Review Order*"), *vacated in part on other grounds*, *United States Telecom Ass'n v. FCC*, 359 F.3d 554 (D.C. Cir. 2004).

16/ *Local Competition Order*, ¶¶ 696, 700.

17/ *Id.*, ¶ 682.

costs the incumbent carriers expect to incur in making unbundled elements available to new entrants, and that the Telecommunications Act of 1996 requires the rates based on these costs to be economically efficient.[18/]

The FCC has "continue[d] to discourage states from using the[se] nationwide [universal service] inputs for the purpose of developing UNE prices."[19/] Such misuse, it has noted, "erroneously assumes away not just the features of an incumbent LEC's existing network but also attributes of the real world in which incumbents and competitors operate."[20/] As to modeling assumptions, the FCC has required that TELRIC prices be based on costs that "assume that wire centers will be placed at the incumbent LEC's current wire center locations."[21/] The FCC did not, however, state (or suggest) that all other locations in a modeled network must be *different* from those employed in the ILEC's existing network.[22/]

In its currently pending *TELRIC NPRM*, the FCC revisited some of its prior assumptions in the *Local Competition Order,* issued when "local competition was largely a theoretical exercise and we placed a premium on the need to stimulate entry."[23/] It did so in light of its conclusion that today "competition has taken root in many areas of the country."[24/] The FCC recognized that in the real world "firms do not instantaneously replace all of their facilities with

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[18/] *Id*,, ¶¶ 113, 685.

[19/] *TELRIC NPRM,* ¶ 46.

[20/] *Id.,* ¶ 47.

[21/] *Local Competition Order*, ¶ 685.

[22/] *See, e.g.*, Exh. No. 2T 3:5-8, (Shelanski) (use of existing network locations is consistent with TELRIC).

[23/] *TELRIC NPRM,* ¶ 2.

[24/] *Id.,* ¶ 3.

every improvement in technology."[25/] And it also "tentatively conclude[d] that our TELRIC rules should more closely account for the real-world attributes of the routing and topography of an incumbent's network in the development of forward-looking costs."[26/]

B. Principles Established by Prior Washington Commission Orders

In its *Eighth Supplemental Order* in Docket Nos. UT-960369 *et seq.*, issued in 1998, the Commission reiterated a number of the foregoing principles established by the FCC.[27/] As the Commission also later emphasized, those are the principles that should govern the establishment of UNE rates — not whether rates are at the low levels that CLECs assert will make entry attractive.[28/] In other words, "healthy competition rests on accurate price signals that tell competitors when to invest and when to use other strategies" — not on "striving for the lowest possible price," which "would send the wrong signal to the market and could harm the development of competition in the long run."[29/]

In addressing appropriate input values for cost models, the Commission has noted that conflicts between the parties "are best resolved by subjecting the claimed values to some form of validation or, where data cannot be compared to the recent experience of efficient firms, careful analysis of the study methodology and assumptions."[30/] Use of "a national proxy, which is not

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[25/] *TELRIC NPRM, ¶* 50. *See also* Exh. No. 1T 4:13-5:13, (Shelanski).

[26/] *TELRIC NPRM,* ¶ 52.

[27/] *See also* Forty-first Supplemental Order, Docket No. UT-003013 (issued Oct. 11, 2002), ¶ 11 ("*Forty-first Supplemental Order*"). In the *Eighth Supplemental Order,* the Commission also identified a number of requirements for cost models proposed for the establishment of UNE rates. We address those requirements at pages 41-42 below.

[28/] Thirty-first Supplemental Order, Docket Nos. UT-960369, -960370, -960371 (issued Dec. 14, 2000), ¶ 23 ("*Thirty-first Supplemental Order*").

[29/] *Id.,* ¶ 24; *see also* Tr. 893:11-16, (Blackmon).

[30/] *Eighth Supplemental Order*, ¶ 240.

based upon company specific information . . . is unacceptable."[31/] Thus, use of "company specific and proprietary data" is acceptable "when other data are unlikely to provide reasonable and accurate results."[32/] In this proceeding Verizon NW has, where possible, provided such company-specific documentation for its input assumptions. In contrast, AT&T has relied largely upon unsubstantiated — and outdated — "experience" of its consultants, which is often alleged to be derived from other carriers, and which typically does not vary from state to state. Both the FCC and the Commission already have rejected HAI Model's extensive reliance on the HAI Model developers' unsubstantiated opinions,[33/] and the Commission should do so again here.

Staff appears to have determined that the inputs for UNE cost models were established once and for all time by the Commission in the *1998 Eighth Supplemental Order* six years ago.[34/] This view makes no sense. There would be no purpose in expending the enormous time and resources in revisiting UNE costs in an extensive generic cost docket of this kind if costs and inputs established many years ago on another record were intended to be binding for all time. As

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[31/] *Id.*, ¶ 340.

[32/] *Id.*

[33/] Tenth Report and Order, *In re Federal-State Join Board on Universal Service, In re Forward-Looking Cost Mechanism for High Cost Support for Non-Rural LECs*, 14 FCC Rcd 20156, ¶ 115 (1999) ("*Tenth Report and Order*") ("We find that the expert opinions on which AT&T and MCI's proposed methodology relies lack additional support that would permit us to substantiate those opinions."); *Eighth Supplemental Order,* ¶¶ 91-103 ("The Commission agrees with GTE that the method used by AT&T to collect data from vendors was flawed … We find that the outside plant data collected from the vendors by the Hatfield engineering team do not provide sufficient validation for the opinion of these experts . . . . In summary, the Commission disagrees with the method used by the Hatfield team to collect data from outside plant contractors"). *See also Tenth Report and Order,* ¶¶ 102, 113, 115, 165, 171, 172, 211, 270, 279, 281, 297, and 327.

[34/] Tr. 1011:10-1012:15 (Spinks).

the Commission made clear at the hearings,[35/] an important purpose of this proceeding is to permit the parties to update the record on these critical input values.

C. The WCB Virginia Arbitration Order

In contrast to the FCC's *Local Competition Order*, *Triennial Review Order*, and *TELRIC NPRM*, the *Virginia Cost Order*, issued by the FCC's Wireline Competition Bureau ("WCB") in 2003,[36/] is neither binding on this Commission nor of any special persuasive value in this case. At the outset of the Virginia arbitration, in response to concerns that it could profoundly impact pending arbitrations in other states, the FCC specifically limited the reach of its authority to arbitrating *an* interconnection agreement in place of the state commission.[37/] Thus, in issuing its UNE cost decision, the WCB confirmed that it had merely stepped into the shoes of that commission.[38/]

Equally important, the WCB did not speak for the FCC in issuing that order. Rather, the FCC has made clear that it considers the WCB's orders in that case to be nothing more than non-binding, "interlocutory staff ruling[s]," which do not constitute "agency policy."[39/] Indeed, the

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[35/] Tr. 1067:16-1070:18, (Spinks); *see also* Supplemental Testimony of Thomas Spinks (filed June 29, 2004) at 3 ("Spinks Supplemental Testimony").

[36/] *See* Memorandum Opinion and Order, *Petition of WorldCom, 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 Expedited Arbitration*, 18 FCC Rcd 17722 (WCB 2003) ("*Virginia Cost Order"*).

[37/] *See* Memorandum Opinion and Order, *Petition of WorldCom, Inc. for Preemption of Jurisdiction of the Virginia State Corporation Commission Pursuant to Section 252(e)(5) of the Telecommunications Act of 1996 and for Arbitration of Interconnection Disputes with Verizon Virginia Inc.,*16 FCC Rcd 6224, ¶ 10 (2001).

[38/] *Virginia Cost Order*, ¶ 2.

[39/] *See* Brief of FCC, *Mountain Communications Inc. v. FCC*, No. 02-1255, at 31 (D.C. Cir. filed June 19, 2003) (citing *MacLeod v. ICC,* 54 F.3d 888, 891 (D.C. Cir. 1995) ("FCC *Mountain Communications* Brief") ("positions of an agency's staff do not preclude the agency from subsequently reaching its own conclusion"); *see also Caiola v. Carroll*, 851 F.2d 395, 399 (D.C. Cir. 1988) (refusing to defer to interpretation by official who was not the head of the agency).

FCC has never cited or relied on the *Virginia Cost Order*, and it has expressly refused to endorse the WCB's earlier non-cost order in the same proceeding.[40/] Moreover the WCB's cost order remains subject to further review by the FCC,[41/] and, as Verizon has demonstrated in its pending application for review of that order with the FCC, the order departs substantially from policy adopted by the FCC itself.[42/] As one FCC Commissioner has already noted in the *TELRIC NPRM,* the WCB's order "may not reflect the direction and spirit of today's decision."[43/] A number of other state commissions have reached similar conclusions, with respect to both the WCB's non-cost[44/] and cost[45/] orders in the Virginia arbitration.[46/]

[40/] *See* Memorandum Opinion and Order, *Application by Verizon Maryland Inc., Verizon Washington, D.C. Inc., Verizon West Virginia Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b]a Verizon Enterprise Solutions), Verizon Global Networks Inc., and Verizon Select Services Inc., for Authorization To Provide In-Region, InterLATA Services in Maryland, Washington, D.C. and West Virginia,* 18 FCC Rcd 5212, ¶ 151 n.601 (2003).

[41/] *See* FCC *Mountain Communications* Brief at 32-33.

[42/] *See generally* Verizon Virginia Inc.'s Application for Review, CC Docket Nos. 00-218, 00-249, 00-251 (FCC Sept. 29, 2003).

[43/] *TELRIC NPRM,* (statement of Commissioner Martin).

[44/] *See* Order Modifying Decision 02-06-076 and Denying Rehearing, *Global NAPs, Inc.*, Decision 03-07-039, 2003 WL 21705386, at *2 (Cal. P.U.C. July 10, 2003) (order "is not a decision of the FCC, and it does not purport to be anything more than a resolution, by arbitration, of specific interconnection disputes. Thus, it is not a precedential decision binding on this Commission"); Order, *Petition of Global NAPs, Inc., Pursuant to Section 252(b) of the Telecommunications Act of 1996, for Arbitration to Establish an Interconnection Agreement with Verizon New England, Inc. d/b/a Verizon Massachusetts f/k/a New England Telephone & Telegraph Co. d/b/a Bell Atlantic-Massachusetts,* Docket No. D.T.E. 02-45, at 12, 13 n.20 (Mass. Dep't of Telecomm. and Energy Dec. 12, 2002) (order not binding authority); Decision Denying Motion, *Colorado Public Utilities Commission's Recommendation to the Federal Communications Commission Regarding Qwest Corporation's Provision of In-Region, InterLATA Services in Colorado,* Docket No. 02M-260T, 2002 Colo. PUC LEXIS 1428, at *5 (Colo. PUC Dec. 11, 2002) (choosing not to amend an earlier decision inconsistent with Virginia non-cost order).

[45/] *See* Final Opinion and Order, *Generic Investigation re Verizon Pennsylvania Inc.'s Unbundled Network Elements*, Docket No. 00016683, at 12 (Pa. P.U.C. Dec. 11, 2003) (*Pennsylvania Final Opinion and Order*) (*Virginia Cost Order* is "merely instructive" and does not necessitate revising prior determinations on choice of model that conflict with those reached in *Virginia Cost Order*).

[46/] Although two courts have determined that the non-cost order is entitled to some degree of deference as an agency decision, *see Indiana Bell Tel. Co. v. McCarty*, 362 F.3d 378, 386-87 (7th Cir. 2004); *MCImetro Access Transmission Servs., Inc. v. BellSouth Telecomms., Inc.*, 352 F.3d 872, 880 n.8 (4th Cir. 2003), neither opinion reflects the FCC's own clearly stated views on the matter.

In any event, the *Virginia Cost Order* sheds little light on how the Commission should resolve the issues in this case. First, it did not address *either* the new cost model proposed here by Verizon NW *or* any version of the HAI Model proposed here by AT&T. Second, it generally adopted a form of baseball arbitration.[47/] Because of that governing principle, its precedential impact is quite narrow. In the context of baseball arbitration, the resolution of an issue in favor of one party's approach required only that the WCB determine that it was preferable to the other party's approach. Because the parties here have proposed different models and assumptions than in the Virginia arbitration, the WCB's determinations are of limited utility in this case.

II. COST OF CAPITAL

In setting the cost of capital for use in calculating Verizon NW's UNE rates, the Commission must employ the fundamental economic principles underlying TELRIC, as set forth by the FCC in the *Local Competition Order* and reiterated and clarified in the *Triennial Review Order*. These principles require that UNE rates (1) be based on forward-looking costs; (2) reflect the risks of a competitive market and the regulatory regime to which the incumbent LEC is subject; (3) send correct economic signals to other carriers for efficient entry and investment decisions; and (4) provide the incumbent LEC an opportunity to recover its forward-looking costs. As Verizon NW cost of capital expert Dr. James Vander Weide explained in his testimony and at the hearings, Verizon NW's cost of capital, including each of its components (capital structure, cost of debt, and cost of equity), complies with each of these principles. By contrast, the other proposals before the Commission are radically inconsistent with TELRIC and with all the other inputs that have been proposed in this case.

47/ *Virginia Cost Order*, ¶ 24.

A. The *Triennial Review Order* and Other Applicable Federal Authority

In the recent *Triennial Review Order*, the FCC clarified that the cost of capital used for UNE rates must assume a competitive market, regardless of the current state of competition:

> A TELRIC-based cost of capital should reflect the risks of a competitive market. The objective of TELRIC is to establish a price that replicates the price that would exist in a market in which there is facilities-based competition. In this type of competitive market, all facilities-based carriers would face the risk of losing customers to other facilities-based carriers, and that risk should be reflected in TELRIC prices.[48/]

As the FCC explained, the assumption of such "increased competition would lead to increased risk, which would warrant an increased cost of capital."[49/]

The starting place for the cost of capital therefore is not the current state of competition in Washington or the competition that might actually exist in the near future. Instead, the cost of capital must assume a hypothetical, forward-looking, fully competitive market, since "state commissions must use a consistent set of assumptions when they calculate the three components of rates (operating expenses, cost of capital, and depreciation expense)."[50/] As the FCC recognized in the *Triennial Review Order*, "[e]stablishing UNE prices based on an unreasonably low cost of capital would discourage competitive LECs from investing in their own facilities and thus slow the development of facilities-based competition."[51/] In addition, using inconsistent assumptions "would reduce artificially the value of the incumbent LEC network [assumed by the pricing methodology] and send improper pricing signals to competitors."[52/]

48/ *Triennial Review Order,* ¶ 680.

49/ *Id.,* ¶ 681.

50/ *TELRIC NPRM,* ¶ 84.

51/ *Triennial Review Order,* ¶ 682; *see also TELRIC NPRM,* ¶ 83 (reiterating the same concern).

52/ *Id.*

Thus, in setting the cost of capital in this case, the Commission must adopt a forward-looking approach that accounts for the risks of a fully competitive wholesale market, not just those that Verizon NW actually faces today.[53/] Verizon NW has proposed a 12.03 percent weighted average cost of capital and 3.95 percent risk premium, which together appropriately and conservatively reflect those risks, as required by TELRIC. As Dr. Vander Weide has explained, Verizon NW's cost of capital proposal reflects the forward-looking costs that a wholesale provider would experience in a competitive market by using market interest rates for long-term debt, the required market return on equity investments of comparable risk, and the average market value percentages of debt and equity in the capital structure of competitive companies.[54/] Verizon NW's cost of capital accounts for the specific regulatory risks Verizon NW would face under the UNE and TELRIC regimes by including a 3.95 percent risk premium. This reflects the risk that Verizon NW will not be able to recover its costs in providing UNEs under TELRIC while offering competitors an ongoing option to cancel their leases pursuant to the FCC's rules,[55/] and allows Verizon NW an opportunity to earn its 12.03 percent weighted average cost of capital.

Verizon NW's 15.98 percent proposed cost of capital is both reasonable and conservative. Indeed, even in today's competitive market conditions, AT&T uses a cost of capital of **[BEGIN AT&T PROPRIETARY]** **[END AT&T PROPRIETARY]**

[53/] In fact, Verizon NW does increasingly face the prospect of robust facilities-based competition in Washington from wireless carriers, VoIP providers, cable telephony providers, and facilities-based CLECs. *See generally* Exh. No. 351TC (West).

[54/] *See* Exh. No. 101T 42:6-43:13, (Vander Weide).

[55/] *See id.* at 8:17-9:5.

to make internal decisions regarding local exchange investments.[56/] Since the FCC made clear that the cost of capital in the fully competitive market assumed for TELRIC normally should be *higher* than the real-world cost of capital in the telecommunications market,[57/] Verizon NW's proposal is eminently reasonable.

By contrast, the cost of capital proposals of Staff and AT&T are not forward-looking and do not reflect the risks of a competitive market, let alone the appropriate regulatory risks. Staff's initial proposal that the Commission simply adopt the 9.76 percent authorized rate of return established by the Commission in 1994 does not comply with more recent FCC statements governing TELRIC interpretations. The Commission's decision in the *Eighth Supplemental Order* to use the authorized rate of return in UNE cost studies was motivated by concern for "the practical problems of turning every cost-based rate filing into a cost of money case."[58/] But the FCC now has expressly provided that the cost of capital is a critical component of UNE rates and must be set consistent with other UNE inputs. It thus is clear that the Commission cannot satisfy its obligation to set TELRIC-compliant UNE rates by adopting the last-authorized retail rate of return as the wholesale UNE cost of capital. In any event, the 1994 rate of return proceeding took place before the passage of the Telecommunications Act of 1996 and the explosion of facilities-based competition from CLECs, wireless, cable television, Internet service, and voice-over Internet protocol ("VoIP") providers. It cannot be described as forward-looking. Staff's

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[56/] *See* Exh. No. 658.

[57/] *See Triennial Review Order,* ¶ 681.

[58/] *Eighth Supplemental Order,* ¶ 221.

revised 10.54 percent proposal fares little better, since it assumes a book value capital structure and thus by its own terms is not forward-looking.[59/]

AT&T's cost of capital proposal is even less supportable. Although AT&T initially recommended the 9.76 percent authorized rate of return last set by the Commission for Verizon NW, its cost of capital witness subsequently proposed an egregiously low 7.45 percent.[60/] That proposal is fully 230 basis points *below* even the authorized rate of return, which, as just noted, itself badly understates Verizon NW's forward-looking cost of capital under TELRIC. While the proposal suffers from multiple flaws, as discussed below, its fundamental errors are the refusal to acknowledge that TELRIC *requires* the assumption of a competitive market,[61/] and the patently erroneous contention that, in a fully competitive market, the risks to Verizon NW would *drop* rather than increase markedly.[62/] As noted above, TELRIC requires an assumption of a competitive market, and that assumption of "increased competition would lead to increased risk, *which would warrant an increased cost of capital*."[63/]

B. Capital Structure[64/]

In order to accurately estimate a TELRIC cost of capital, the capital structure must be market-based. A market-based capital structure reflects the capital structure that investors assume on a forward looking basis. The alternative to a market-based capital structure is a book

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59/ *See* Exh. No. 106T 14:25 15:21, (Vander Weide).

60/ *See* Exh. No. 651T 6:10-11, (Selwyn).

61/ *See* Exh. No. 651T 8:10, (Selwyn) ("UNEs are, by their nature, *monopoly* services being offered on a noncompetitive basis") (emphasis in original).

62/ *See* Exh. No. 651T 39:15-40:15, (Selwyn).

63/ *Triennial Review Order,* ¶ 681 (emphasis added).

64/ Verizon NW addresses the sub-headings indicated in the Commission's outline under this issue in the following sections.

value capital structure based on the embedded or historical costs of Verizon NW's assets, which directly conflicts with the FCC's forward-looking cost standard.

Verizon NW's proposed capital structure of 25 percent debt and 75 percent equity is forward-looking and consistent with what investors expect in a competitive market. It is based on the average capital structures of a large number of real-world competitive firms. Specifically, Dr. Vander Weide examined capital structure data for the Standard & Poor ("S&P") Industrials and a group of local telecommunications companies with local exchange subsidiaries.[65/] Verizon NW's proposed capital structure is clearly superior to the capital structure proposed by Staff, which recommended that the Commission adopt the capital structure set in the 1994 rate of return proceeding, consisting of 37 percent long-term debt, 7 percent short-term debt, and 56 percent equity.[66/] A book capital structure from 1994 clearly cannot reflect investors' forward-looking expectations with respect to investments in a competitive marketplace today.[67/]

AT&T's proposal, although styled as a market-based capital structure, is a similarly unrealistic measure of investor expectations in a competitive industry. Dr. Selwyn proposes 70 percent equity and 30 percent debt.[68/] Yet when measuring its own cost of capital even in today's competitive market, AT&T uses a capital structure that assumes **[BEGIN AT&T PROPRIETARY]** **[END AT&T PROPRIETARY]**.[69/] Even leaving this inconsistency aside, AT&T's effort to defend its 70/30 proposal is seriously

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65/ *See* Exh. No. 101T 42:21-43:2, (Vander Weide).

66/ *See* Exh. No. 1062T 14:4-9, (Spinks).

67/ *See id*. 73:21-23.

68/ *See* Exh. No. 651T 59:1-2, (Selwyn).

69/ *See* Exh. No. 658.

flawed. As Dr. Vander Weide showed, Dr. Selwyn's analysis on behalf of AT&T incorrectly included the capital structure for Qwest, a company that is so highly leveraged that bond rating agencies have lowered its bond ratings to below investment grade, and that is largely unable to attract the capital needed to invest in its telecommunications network.[70/] Such skewed and anomalous data can hardly be said to be relevant to the capital structure investors would expect in making long-term, forward-looking investments. If Dr. Selwyn had excluded Qwest, as he should have, the average capital structure for his proxy group of the remaining Regional Bell Holding Companies ("RBHCs") would closely match Verizon NW's proposed capital structure.[71/]

C. Cost of Debt

Verizon's proposed 6.26 percent cost of debt is appropriately based on market valuations of the average yield to maturity on Moody's A-rated industrial bonds.[72/] As Dr. Vander Weide explained, this approach best approximates the yield Verizon NW would pay on the debt issues it would use to finance actual construction of its network, and is in fact conservative because it excludes the flotation costs that Verizon NW would have to pay on such debt issues.[73/]

AT&T insists, however, that the cost of debt should reflect the average yield to maturity on all the outstanding debt of Verizon NW's parent company. This proposal is flawed for many reasons, including the fact that much of the long-term debt on Verizon's balance sheets is near to maturity and is therefore now trading as short-term debt. Inclusion of this debt does not make

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70/ *See* Exh. No. 106TC 78:17-19, (Vander Weide).

71/ *See id*. at 79:5-8.

72/ *See* Exh. No. 101T 45:16-17, (Vander Weide).

73/ *See* Exh. No. 101T 49:12-18, (Vander Weide).

sense in a forward-looking, long run UNE cost study, where the facilities being modeled are long-term investments.[74/] AT&T's proposal also is utterly unrealistic: the lower yields to maturity on long-term debt that is priced as short-term debt do not reflect the true interest cost being paid on this debt because Verizon's debt is largely not callable and Verizon cannot refinance it at the yields to maturity that AT&T proposed.[75/] Therefore, neither Verizon nor any hypothetical carrier could refinance its debt at the yields to maturity that Dr. Selwyn presented.[76/]

D. Cost of Equity

1. Determining the appropriate sample — which firms should be included/excluded and why?

Verizon NW's cost of equity is based on application of the discounted cash flow ("DCF") model to the S&P Industrials. Since TELRIC estimates the forward-looking cost of a wholesale UNE provider in a fully competitive market, and since Verizon NW is neither market-traded nor solely engaged in providing UNEs, a proxy is necessary to estimate the appropriate cost of equity. To ensure that the cost of capital in TELRIC studies reflects the risks associated with a competitive market, the proxy selected must reflect the cost of equity borne by representative companies facing robust competition. Verizon NW used the S&P Industrials as a conservative proxy group because it is a large, well-known sample of publicly traded companies operating in competitive markets.[77/] In order to reduce any statistical anomalies, Dr. Vander Weide used only the second and third quartiles of the S&P Industrials, thereby eliminating the first quartile, whose

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74/ *See id*. at 47:6-14.

75/ *See id*. at 48:10-16.

76/ *See id*. at 48:2-5 (Vander Weide).

77/ *See* Exh. No. 101T 47:9-14, (Vander Weide). The S&P Industrials is a conservative proxy group because the average industrial company has a much lower investment in long-term fixed assets than the average telecommunications company. *See id*.

growth rates were significantly lower than average, and the fourth quartile, whose growth rates were significantly higher than average.

In contrast, AT&T would rely exclusively on data from the four RBHCs. As a preliminary matter, however, the RBHCs represent a very small data sample. Statistical analysis based on three or four companies is inherently less reliable than using a broader range of companies, and may reflect anomalies specific to existing management or the dramatic restructuring in the telecommunications industry over recent years.[78/] Indeed, because of that restructuring, the growth prospects for the RBHCs are highly uncertain and there is a high standard of deviation of analysts' growth forecasts for these companies.[79/] As Dr. Vander Weide explained, it is more important to study a reliable proxy group of companies that face representative competitive risk than to use data from the precise same industry from a miniscule group of companies.[80/]

AT&T argues that a UNE-only company would have a lower cost of equity than other competitive industries. This view was totally discredited. To begin with, AT&T's inclusion of Qwest is singularly inappropriate due to the unique circumstances facing the company described above — more than $1 billion in shareholder deficit, earnings insufficient to cover interest on its debt, cash flows from operations that are less than capital expenditures, and other crippling liabilities.[81/] AT&T's selective use of Qwest's data also is highly questionable and biases its

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78/ *See* Exh. No. 106TC 42:4-16, (Vander Weide).

79/ *See id.*

80/ *See id.* at 43:17-44:17.

81/ *See id.* at 39:13-40:17, (Vander Weide).

results.[82] More generally, however, the RBHCs are less risky than the UNE-only business required to be modeled here, because they can diversify away many of the technology, geographic, and regulatory risks that a UNE provider would face.

AT&T sought to show that the provision of UNEs is *less* risky than the other services the RBHCs provide. Specifically, AT&T argues that the RBHCs' betas (a fundamental measurement of risk that measures the movement in stock prices compared to the market as a whole) are *higher* than they would be if the RBHCs provided only UNEs, because, allegedly, their betas increased as they increased their investment in non-ILEC assets, such as wireless and broadband.[83] But the analysis in support of this point was fatally flawed. First, AT&T witness Dr. Selwyn admitted that the data in his regression analysis relating to SBC's percentage of "non-ILEC" assets for 2001-2003 were overstated because he had incorrectly included assets for SBC's ILEC subsidiaries Ameritech, Nevada Bell, and Southern New England in his "non-ILEC" category. Thus, he admitted, "certainly the numbers from [the second half of 2001] through [the first half of 2003] for SBC are wrong," and "it appears that the numbers for [the second half of 2000] and [the first half of 2001] are also wrong for the same reason."[84] Dr. Selwyn further admitted that some of his regression data for Verizon was not taken from Verizon 10-Ks and 10-Qs as he had previously stated, and that the claimed support for his study was "misleading."[85] With regard to Qwest, Dr. Selwyn's analysis is similarly unreliable. First, he

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[82] *See id.* at 40:20 41:8. As Dr. Vander Weide explained, AT&T's witness used Qwest's highly leveraged data in his capital structure proxy group but did not use Qwest data in his cost of debt or cost of equity calculations.

[83] *See* Exh. No. 651T 39:12-49:25, (Selwyn).

[84] Tr. 741:14-17, (Selwyn). Although Dr. Selwyn attempted to correct this error, he could only create new data by extrapolation, since data for the ILEC subsidiaries does not exist. The results of his revised study, in addition to containing a number of other flaws, are therefore speculative. *See* Exh. No. 1153 at 2-3.

[85] Tr. 750:12, (Selwyn).

incorrectly claimed that Qwest's 2002 annual report, which restated the data he used for Qwest in his regression analysis, was unavailable at the time he filed his written testimony in April 2004. But as Dr. Vander Weide explained, Qwest filed this report in October 2003, months before AT&T's witness submitted his testimony and his revised regression analysis.[86/] In addition, the Qwest data suffered from myriad flaws, including the failure to include data for Qwest for the first half of 2003, the unusual nature of the Qwest data as compared to the other RBHCs, and the use of data from U S West rather than Qwest.[87/]

In sum, AT&T's efforts to show that the Commission should use the RBHCs as a proxy rather than the S&P proxy Dr. Vander Weide uses, and that a lower cost of equity would be appropriate for a UNE-only business than for other competitive industries, all fail and must be rejected.

2. Which methodology is appropriate and why?

Verizon NW used the single-stage DCF model to calculate the cost of equity. This model best reflects the risks of providing UNEs in a competitive market. In addition, this Commission has long recognized the merits of the DCF model and has chosen it on numerous occasions over the Capital Asset Pricing Model ("CAPM") proposed by AT&T.[88/] As Dr. Vander Weide explained, the DCF model uses analysts' growth rates as an estimate for investors' perceptions of

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[86/] *See* Exh. No. 1153 at 3.

[87/] *See id*. at 3-12.

[88/] *See* Fourth Supplemental Order, *Washington UTC v. Washington Natural Gas Company*, Docket No. UG-920840, 1993 WL 500058, at *18 (Wash. U.T.C., Sept. 27, 1993); Sixth Supplemental Order, *Washington UTC v. American Water Resources*, Docket No. UW-980072, *et al*., 1999 WL 177547, at *6 (Wash. U.T.C., Jan. 21, 1999); Third Supplemental Order, *Washington UTC v. Avista Corp*., Docket No. UE-991606, *et al*., 2000 WL 1532899 (Wash. U.T.C., Sept. 29, 2000).

future earnings growth.[89/] This makes the DCF model especially appropriate for measuring the TELRIC cost of equity, as it reflects the best estimate of investors' expectations for long-term growth and are statistically superior to historically oriented growth calculations.[90/] In addition, the single-stage DCF model is easy to apply, as it requires only two assumptions: the dividend yield, which can be observed in the marketplace, and the growth rate, which can be estimated for most companies through the consensus analysts' forecasts published by I/B/E/S.[91/]

The DCF model used by Verizon NW correctly reflects the fact that, as competition increases, so will the risk and, hence, the cost of equity investors will require to invest in the UNE enterprise. As noted above, AT&T's efforts to discredit the DCF model by trying to show that the cost of equity it produces is higher than that of the RBHCs today is without merit. Equally without merit is Dr. Selwyn's recommendation to use the CAPM to model the cost of equity based on his view that the CAPM is "both easier to apply and more theoretically sound" than the DCF model. This Commission and others have already rejected that notion.[92/] The CAPM requires three fundamental inputs—the risk-free rate, the company-specific risk factor or beta, and the risk premium on the market portfolio—that are all subject to a high degree of uncertainty.[93/] That alone is reason to reject the CAPM as an alternative.[94/]

89/ *See* Exh. No. 106TC 66:18 67:16, (Vander Weide).

90/ *See id*. at 68:1-3, (Vander Weide).

91/ *See id.* at 70:20-22.

92/ *See supra* note 88; *see also Pennsylvania Final Opinion and Order* at 60-61 & n.34.

93/ *See* Exh. No. 106TC 70:17-19, (Vander Weide).

94/ As Dr. Vander Weide explained, the CAPM also suffers from a number of other flaws that make it an inappropriate choice for estimating a TELRIC cost of equity. *See id.* at 61:18-63:17.

Even leaving aside its inherent complexity, the CAPM should be rejected because AT&T incorrectly employs it to produce a grossly low cost of equity. First, AT&T's witness used the yield on short-term Treasury bills to estimate the risk-free rate for the CAPM, despite the fact that telecommunications facilities are inherently long-lived. Treasury bills are not risk-free over the long-term, and this error alone results in a 100 basis point understatement of AT&T's proposed cost of equity.[95/] AT&T also used the seriously flawed beta measurement that it based on the four-RBHC proxy group; as noted above, the entire calculation underlying its assessment of that beta is erroneous and unreliable. In addition, AT&T used U S West's beta from the late 1990s as an estimate of the current ILEC beta, even though the risk of investing in incumbent LECs has increased significantly since that time. U S West's outdated beta is simply not a credible proxy for a current ILEC beta. AT&T's witness further erred by attempting to disaggregate the total company betas of his proxy companies into particular business segments, in order to derive a "pure ILEC" beta. As Dr. Vander Weide explained in detail, this analysis is flawed and the results do not comport with data reported by the RBHCs on their financial reports.[96/]

3. Recommended cost of equity

Using the single-stage DCF model applied to the S&P Industrials as described above, Verizon NW proposed a 13.95 percent cost of equity. Although the DCF model is superior to

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[95/] *See id.* at 52:9-12

[96/] *See id.* at 52:15-60:7.

the CAPM, Dr. Vander Weide also calculated a cost of equity using the CAPM with alternate inputs to those used by AT&T's witness, and derived a cost of equity of 13.90 percent.[97/]

E. Option Value of UNE and Effect on Cost of Money

Although Verizon NW's proposed capital structure, cost of debt, and cost of equity accurately model the cost of capital of a company operating in a competitive market, an additional risk premium is needed to account for the regulatory risks of the TELRIC standard, including the risk of lease cancellation. The risk premium is designed to ensure that Verizon NW actually has an opportunity to earn the allowed rate of return for UNEs. Since traditional cost of equity methodologies such as the DCF and CAPM do not include the value of giving CLECs the option of canceling their leases, this risk must be separately calculated. As Dr. Vander Weide explained, these risks are significant. The central goal of the 1996 Act is to facilitate movement of customers *off* the networks of incumbents such as Verizon NW, and there are numerous alternatives for competitors to serve their customers over facilities other than those owned by Verizon NW. These include CLEC-owned facilities and, increasingly, bypass technologies such as wireless, cable, and VoIP.[98/]

To calculate the risk premium, Dr. Vander Weide employed a widely-accepted method of valuing options to cancel short-term leases. Such leases, referred to in financial literature as "operating leases," are more risky than long-term, non-cancelable leases, because there is an increased chance that the lessor will be unable to recover its investment and earn a fair return on

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97/ *See* Exh. No. 101T 61:10-12, (Vander Weide). Dr. Vander Weide's CAPM analysis, in contrast to Dr. Selwyn's, used the RBHCs' reported betas, the Ibbotson Associates' risk premium, and the interest rate on long-term Treasury bonds as an estimate of the risk-free rate. *See id*.

98/ *See* Exh. No. 106TC 83:19-21, (Vander Weide).

that investment.[99/] This risk is the reason that the rate for a daily car rental is much higher than the per-day cost of a long term car lease. For Verizon NW, operating leases are quite risky because its network investments will require substantial sunk costs. As CLECs build their own facilities or use alternative technologies to bypass Verizon NW's network (or purchase UNEs at increasingly lower rates), Verizon NW's ability to recover the costs of those facilities investments will necessarily decline. As Dr. Vander Weide explained, it is therefore virtually certain that Verizon NW will not earn its market cost of capital as a rate of return.[100/] The Commission should therefore adopt Verizon NW's proposed risk premium of 3.95 percent in order to allow Verizon NW to earn its 12.03 percent market cost of capital. Verizon NW therefore proposes a cost of capital of 15.98 percent for use in calculating UNE rates in this proceeding.

III. DEPRECIATION

The Commission should calculate depreciation expense for purposes of developing UNE rates in Washington based on the economic depreciation lives Verizon NW uses in its financial reports, which are developed pursuant to Generally Accepted Accounting Principles ("GAAP").[101/] Verizon NW's GAAP lives are the only lives proposed in this proceeding that comply with the FCC's TELRIC requirements.

99/ *See* Exh. No. 101T 41:4-17, (Vander Weide).

100/ *See id.* at 42:21-43:13; 84:12-16.

101/ *See* Exh. No. 153 5:8-11, (Sovereign). Mr. Sovereign's direct testimony in this proceeding has been adopted by Anthony J. Flesch. *See* Exh. No. 151T 3:23, (Flesch).

A. Verizon NW's GAAP Lives Are Forward-Looking and Appropriate For Use in a UNE Cost Study.

GAAP depreciation lives provide a sound and realistic estimate of the forward-looking "anticipated economic life of assets"[102/] — that is, the expected time period, looking forward, during which assets can be expected to produce economic benefit.[103/] GAAP lives take into account the factors that shorten the useful lives of the telecommunications assets subject to unbundling requirements — primarily, the pace of technological innovation and the impact of competition.[104/] To ensure that its GAAP lives are up to date, Verizon NW reassesses them on at least an annual basis, or even more often if necessary.[105/] Because they are included in Verizon NW's financial reports, Verizon's proposed depreciation lives must be reviewed and approved by its external auditors before being submitted to the Securities and Exchange Commission and other government entities.[106/] Thus, Verizon's proposed GAAP lives are inherently forward-looking and reliable.

Given the speed of technological change in telecommunications, as well as growing competition from several sources,[107/] the use of GAAP to determine the depreciable lives for telecommunications assets is particularly appropriate. GAAP lives also are reliable. Contrary to AT&T's claims, GAAP lives are not governed by the principle of "conservatism," such that a company would overstate its expenses (i.e., by using overly shortened asset lives) in order to

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[102/] *TELRIC NPRM*, ¶ 99.

[103/] Exh. No. 153 3:16-17, (Sovereign).

[104/] *Id.* at 6-8; *see also Triennial Review Order,* ¶ 685 (stating that it is generally agreed that "depreciation should reflect any factors that would cause a decline in asset value, such as competition or advances in technology").

[105/] Exh. No. 151T 7:18-20, (Flesch). *See also* Exh. No. 153 5:8-12, (Sovereign).

[106/] Exh. No. 153 5:6-11, (Sovereign); Exh. No. 151T 7:15-21, (Flesch).

[107/] Exh. No. 351TC 2:7-12:12, (West).

protect investors.[108/] Rather, the Financial Accounting Standards Board ("FASB"), which authors GAAP, has taken a series of actions to ensure that such conservatism is *excluded* from GAAP.[109/] And companies have many incentives to avoid understating their depreciation lives, including the avoidance of adverse financial consequences and the prospect of civil or criminal liability.[110/] Verizon NW also "benchmarked" these GAAP lives against those used by other firms in the industry such as AT&T,[111/] as endorsed by the Missouri Commission.[112/] These comparisons reveal that Verizon NW's proposed depreciation lives generally are equal to or longer than those used by its competitors.[113/]

Numerous state commissions have endorsed the use of GAAP depreciation lives in UNE cost studies,[114/] including those in California,[115/] the District of Columbia,[116/] Illinois,[117/] Indiana,[118/]

[108/] Exh. No. 152T 3:14-16, (Flesch) (citing Exh. No. 1001TC 43-44 (Lundquist)).

[109/] *See id.* at 4:14-5:7.

[110/] *Id.* at 5:14-6:14.

[111/] *See* Exh. No. 153 10-14; Exh. No. 152T 8:14 11:11, (Flesch).

[112/] *See* Final Arbitration Order, *In the Matter of AT&T Communications of the Southwest Inc.'s Petition for Arbitration Pursuant to Section 252(b) of the Telecommunications Act of 1996 to Establish an Interconnection Agreement between AT&T Communications of the Southwest, Inc. and GTE Midwest Inc.*, Case No. TO-97-63, Attachment C at 77 (Mo. P.S.C. July 31, 1997) ("*Missouri Order*").

[113/] *See* Exh. No. 153 at 11-13; Exh. No. 155. They are also within the range of the lives developed by Technology Futures Inc. ("TFI"). *See* Exh. No. 153 at 14. Although AT&T attempts to disparage the TFI lives, *see* Exh. No. 1001TC 46:6-12, (Lundquist), TFI in fact has a successful track record in forecasting the type and pace of technological developments that impact the useful lives of assets. *See* Exh. No. 152T 10:15-11:11, (Flesch).

[114/] *See* Exh. No. 153 at 14-16.

[115/] Decision 96-08-021, *Open Access to Bottleneck Services and to Establish a Framework for Network Architecture Development of Dominant Networks*, Rulemaking No. 93-04-003, at 77 (Cal. P.U.C. Aug. 2, 1996).

[116/] Opinion and Order, *In the Matter of the Implementation of the District of Columbia Telecommunications Competition Act of 1996 and Implementation of the Telecommunications Act of 1996*, Formal Case No. 962, ¶¶ 333-34 (D.C. P.S.C. Dec. 6, 2002).

[117/] *See, e.g.,* Illinois Bell Telephone Company Filing to Increase Unbundled Loop and Nonrecurring Rates, Docket No. 02-0864, at 77 (Ill. Commerce Comm'n June 9, 2004) ("*Illinois Depreciation Order*").

Michigan,[119] and Missouri.[120] And in cases under section 271 of the Telecommunications Act of 1996, the FCC approved the use of GAAP lives by SBC (in Kansas and Oklahoma) and by Verizon (in Pennsylvania).[121] As the Illinois Commerce Commission has recently concluded, such lives "are more in tune with current and forward-looking conditions" and thus "are more in line with TELRIC principles."[122]

B. The Depreciation Inputs Recommended By Staff and AT&T Do Not Comply With TELRIC and Are Outdated.

In contrast to the FCC and these other state commissions, Staff and AT&T urge the Commission to recycle the same inputs it prescribed four years ago in Docket No. UT-992009.[123] Use of those lives, however, is inappropriate — and in fact, directly contrary to TELRIC — for two primary reasons.

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[118] Order, *Commission Investigation and Generic Proceeding of Rates and Unbundled Network Elements and Collocation for Indiana Bell Telephone Company, Inc. d/b/a SBC Indiana Pursuant to the Telecommunications Act of 1996 and Related Indiana Statutes*, Cause No. 42393, at 60 (Ind. Util. Reg. Comm'n Jan. 5, 2004) ("*Indiana Commission Decision*").

[119] Opinion and Order, *On The Commission's Own Motion To Consider The Total Service Long Run Incremental Costs And To Determine The Prices Of Unbundled Network Elements, Interconnection Services, Resold Services And Basic Local Exchange Services For GTE North, Inc*., Docket No. U-11281, at 28 (Mich. P.S.C. Feb. 25, 1998).

[120] *Missouri Order*, Attachment C at 77.

[121] Memorandum Opinion and Order, *Joint Application by SBC Communications Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma*, 16 FCC Rcd 6237 ¶ 76 (2001) ("*Kansas/Oklahoma § 271 Order*"); Reply Declaration of Daniel J. Whelan and Gary E. Sanford, *Application by Verizon Pennsylvania Inc. et al. for Authorization to Provide In-Region, InterLATA Services in Pennsylvania*, FCC 01-269 CC Docket No. 01-138, at 16-18 (Aug. 2001).

[122] *Illinois Depreciation Order* at 77; *see also id.* (stating that "the use of financial reporting lives [i.e., GAAP lives] both reflects and encourages the use of new and efficient technologies, as well as investment in infrastructure," and predicting that increasing competition would "shorten[] the useful economic life of [SBC's] equipment").

[123] *See* Exh. No. 1067 at 9; Ex No. 851T 35:5-36:5, (Mercer).

First, those lives were set for regulatory accounting purposes pursuant to a rate-of-return methodology that the 1996 Act specifically prohibits for use in setting UNE rates.[124/] The purpose of the earlier proceeding was to set retail rates that would allow Verizon NW to recover its historical costs — that is, the costs of its embedded assets.[125/] But the 1996 Act expressly provides that UNE rates must be based on the "cost . . . determined *without* reference to a rate-of-return . . . proceeding . . . of providing the [UNE]."[126/] Here, "cost" is to be determined pursuant to TELRIC, which, in contrast to the historical method used for determining retail rates, assumes the existence of full competition and the deployment of the least-expensive, most-efficient technology that is currently available, without reference to historical costs.[127/] Thus, adoption in this proceeding of the depreciation inputs developed four years ago for calculating *retail* rates would violate TELRIC.

Second, the depreciation lives proposed by Staff and AT&T are now completely outdated, as they do not account for the various competitive and technological developments that have occurred since 2000 and that have substantially shortened the useful lives of Verizon NW's assets.[128/] As the Commission recognized at the hearing, it is important in determining UNE rates that inputs be properly updated.[129/] Indeed, Staff witness Mr. Spinks acknowledged the issue

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[124/] *See* Exh. No. 151T 5:19-6:7, (Flesch).

[125/] *Id.* at 5:5-7.

[126/] 47 U.S.C. § 252(d)(1)(A)(i) (emphasis added); *see also Verizon Communications Inc. v. FCC*, 535 U.S. 467, 496 (2002).

[127/] *See Triennial Review Order,* ¶¶ 670, 681 & n.2048; *Verizon Communications*, 535 U.S. at 496.

[128/] *See* Exh. No. 151T 6:9-12, (Flesch).

[129/] *See* Tr. 1069:8-21, (Chairwoman Showalter).

"whether Verizon's asset lives and depreciation rates should first be updated"[130/] before being employed to calculate UNE rates. The GAAP lives that Verizon NW proposes are continually updated, and accordingly, they represent the most forward-looking lives available to the Commission for determining UNE rates in Washington.

IV. EXPENSE AND OTHER ANNUAL COST FACTORS

After Verizon NW develops its forward-looking material investment, it calculates the recurring costs associated with the modeled network plant and equipment using Annual Cost Factors ("ACFs"). ACFs express the relationship between expenses and investment for particular equipment or plant.

Verizon NW uses its actual GAAP financial accounting cost data reported to the SEC as a starting place for its analysis of forward-looking expenses and investment. As noted above, Verizon NW operates in a competitive environment with pressures from wireless, VoIP, cable telephony, and facilities-based CLEC providers. Thus, its expenses already are extremely efficient.[131/] But it then updates these accounting data with forward-looking adjustments. This approach is consistent with the FCC's view that "the best method of projecting expenses is to make forward-looking adjustments to actual expenses."[132/] Consistent with the FCC's guidance, the Illinois Commission recently found that "[t]he mere fact that SBC started with historical data does not violate TELRIC principles," and concluded that, with limited adjustments, "[SBC's] data is sufficiently forward-looking."[133/] This approach produces far more realistic, relevant data

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130/ Exh. No. 1067 at 13.

131/ *See* Simon Flannery, *et al.*, Morgan Stanley Equity Research, Telecom Services: 2004 in Prospect: Listening to the Investor, at 7 (Jan. 12, 2004).

132/ *TELRIC NPRM, ¶* 112.

133/ *Illinois Depreciation Order* at 229.

than the completely hypothetical expense data AT&T proposes, which depart entirely from reality based on completely theoretical assumptions about potential improvements in productivity.

Furthermore, the expenses actually produced by Verizon NW's model reflect the economies produced by the specific, efficient *mix* of forward-looking investment modeled for the TELRIC network. This is an advantage of the ACF approach as compared to a tops-down approach that is designed to recover a fixed dollar amount. Verizon NW applies the ACF for the relevant plant, such as buried fiber cable, to the units of the relevant type of network investment. This means that if the model includes fewer units of a certain type of technology, there are fewer resulting expenses produced by the model that would result from using that technology.[134/] For example, as fiber replaces copper in the TELRIC network, the model reflects the cost-saving efficiencies of using easier-to-maintain fiber. Fewer units of copper feeder-related investment are assumed in the forward-looking network, and there accordingly are a lower level of copper-feeder-related expenses than there would be if more copper were used; correspondingly, a greater percentage of feeder-related expenses will instead be the *more* efficient expenses associated with fiber.

AT&T's expense factors witness, Mr. Lundquist, consequently is wrong that Verizon NW's factor study produces embedded expenses that do not account for the forward-looking investment used in the TELRIC network.[135/] Mr. Lundquist insists that expenses should be adjusted to account for changes he contends will be made in the forward-looking network, such as copper feeder being increasingly replaced by fiber-fed DLC systems or multiple, smaller-sized

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[134/] Exh. No. 228TC 96:19-21, (Verizon Panel Rebuttal).

[135/] Exh. No. 1001TC 6:15-17, (Lundquist).

cable being replaced by fewer, larger-sized cables.[136/] But Verizon NW's studies in fact reflect these precise "forward-looking" modifications: For example, VzLoop models *all* DLCs as being fiber-fed. And cables in the TELRIC network are sized to fit demand, so that one 400-pair cable will be modeled even if the existing network uses two smaller ones due to the way that demand expanded over time.[137/] Since, as noted above, Verizon NW then calculates the forward-looking expenses associated only with this adjusted, forward-looking network model, Verizon NW calculates expenses precisely as Mr. Lundquist advocates.

In addition to producing only those expenses associated with forward-looking plant, Verizon NW also makes several adjustments to its booked expenses to ensure that they are forward-looking and fully appropriate for use in a TELRIC study. For example, Verizon NW recognizes that much of the copper in its network has been in the ground for many years and is of an older generation; to reflect the fact that overall copper-related maintenance in a forward-looking network, using newer copper, would likely be lower, Verizon NW adjusts the maintenance expenses for copper cable downward by 5 percent.[138/] Verizon NW also adjusts for cost savings related to the Bell Atlantic-GTE merger, eliminates one-time merger expenses, and makes other similar adjustments to "normalize" expenses to ensure that they are representative and appropriate for a forward-looking study.[139/]

136/ Exh. No. 1001TC 7:11-12, (Lundquist).

137/ Exh. No. 228TC 21:13-16, (Verizon Panel Rebuttal). Mr. Lundquist also argues that the forward-looking network should reflect expenses associated with a different mix of aerial, buried and underground structures. However, his own colleagues appear to disagree with him, since for the HM 5.3 loop model, AT&T proposes a structure mix based on ARMIS data. Exh. No. 951T 17 (Fassett).

138/ Exh. No. 228TC 92:19-21, (Verizon Panel Reubttal).

139/ Exh. No. 201TC 144:11-150:5, (Verizon Panel Direct); Exh. No. 228TC 92:16-19, (Verizon Panel Rebuttal). Verizon NW also makes an adjustment to remove retail avoided costs, discussed below. In addition, Verizon NW makes adjustments for expenses that it recovers from other charges, such as non-recurring and DUF charges. The DUF charges include the expenses associated with the computer systems that record and transmit this

Verizon NW also makes productivity and inflation adjustments to its expenses to account for anticipated process improvements and technological changes as well as labor and price inflation over the planning period during which these UNE rates will be in effect. Verizon NW applies the non-farm business productivity index to make its 2001 booked expenses current and further applies the productivity index produced from a macroeconomic model maintained by Economy.com for the remaining years of the planning period. It follows a similar process for inflation using both the Consumer Price Index ("CPI") and the Bureau of Labor Statistics' Labor Compensation Index. Verizon NW selected these indices because they are widely used for forecasting, will not be skewed by aberrant data in a particular year, and are updated quarterly.[140/]

AT&T advocates the use of a five-year average of the wired telecommunications productivity index from years 1996 to 2001.[141/] But that average is skewed by the significant peak in productivity during the first few years following the 1996 Act. The productivity numbers *dropped* precipitously from 7.2 percent in 1999 to 1.6 percent in 2001, the last published year.[142/] This decline suggests that the spike in the first few years of AT&T's sample is unlikely to be representative of future productivity in the industry, and that the average is not predictive. Moreover, since the numbers are available only through 2001, AT&T's approach

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information. *See* Verizon Exh. No. 225, CD #2 (filed June 26, 2003) / 6. Factors Support Files / Expense Factor & Loading / Washington 2001 UNE Expense Factor and Loading Documentation.pdf / Workpaper 1.2.2.

[140/] Exh. No. 228TC 118:4-14, (Verizon Panel Rebuttal). Recently, in response to Bench Request No. 4, Verizon NW updated its inflation and productivity data with the most recent data and forecasts available. Exh. No. 1153.

[141/] Exh. No. 1001TC 33:11-14, n.58, (Lundquist).

[142/] Exh. No. 228TC 120:20-21:2, (Verizon Panel Rebuttal).

would not satisfy the Commission's directive to use the most up-to-date, forward-looking productivity figures.[143/]

While Verizon NW's approach is straightforward and produces accurate, forward-looking expenses as required by TELRIC, we address the following specific issues to provide a fuller picture of the approach and to respond to certain baseless criticisms of Verizon NW's ACF study.

A. Verizon's Forward-Looking Calibration ("FLC") Factor

As a final step in ensuring that the ACFs actually produce accurate, forward-looking expenses when applied in Verizon NW's studies, Verizon NW makes one additional adjustment. It applies what is called the Forward-Looking Calibration Factor ("FLC") to the denominator of its ACFs. The FLC, much criticized by AT&T, is in fact quite straightforward: it is simply a ratio of TELRIC investment to book investment.[144/] In developing its ACFs, Verizon NW starts with its book investment. Its ACFs thus are initially a relationship of the forward-looking expenses Verizon NW has identified to book investment. The FLC simply converts the book investment in the denominator of the ACF to forward-looking investment, so that the ACF then expresses the correct relationship: forward-looking expense to forward-looking investment. Once this adjustment is made, the ACF can properly be applied to forward-looking investment used in the TELRIC studies to produce forward-looking unit expenses. Verizon NW has calculated the aggregate level of TELRIC investment to book investment to be 0.85, which it used as the FLC in its ACF study.[145/]

143/ Exh. No. 1153.

144/ Exh. No. 201TC 151:3-4, (Verizon Panel Direct).

145/ *See* Verizon Exh. No. 227, CD #2 (filed Jan. 26, 2004) / 6. Factors Support Files / Expense Factor & Loading / Washington 2001Revised Expense Factor and Loading Documentation 1-12-04.pdf / Workpaper 3.4. If

Without applying the FLC, the result would be distorted expense figures that are reduced simply because of a mathematical mismatch. This is so because TELRIC investment typically is lower than Verizon NW's book investment. The problem can be illustrated by assuming a switch with a book cost of $40,000. If the adjusted, forward-looking maintenance cost associated with that switch (accounting for productivity, inflation, etc.) is $1000, the pre-FLCed maintenance ACF would be .025 ($1,000/$40,000). Next, assume that the TELRIC price for the switch, after discounts are applied, is modeled on the assumption that it should cost $10,000. If the forward-looking expense-to-book investment .025 ACF is applied to this $10,000 TELRIC switch investment, the result would be expenses of only $250.

As a substantive matter this makes no sense. It should still cost $1,000 to maintain the switch, notwithstanding that it is now assumed one can buy the switch for less. It is, after all, the same switch, and any anticipated changes to the maintenance expenses already are accounted for in the forward-looking, $1,000 annual maintenance expense. What has happened, as the administrative law judge who considered this issue for the New York Public Service Commission explained, is a "double counting [of] the TELRIC adjustment"[146/] — that is, a reduction above and beyond the TELRIC expense adjustments Verizon NW already has made, which has no substantive basis whatsoever. Or as the New York PSC itself noted, Verizon NW "will underrecover expenses to a degree not contemplated by the TELRIC method."[147/]

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the amount of TELRIC investment changes as a result of changed inputs ordered by the Commission, the FLC should be adjusted as well to account for this.

[146/] Recommended Decision on Module Three Issues, Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements, New York Case 98-C-1357, at 44 (N.Y. P.S.C. May 16, 2001) ("*Recommended Decision*").

[147/] *See Order on Unbundled Network Element Rates*, Docket No. 98-C-1357, at 57 (N.Y. P.S.C., Jan. 28, 2002) ("*New York UNE Order*").

Verizon NW applies the FLC to remedy that artificial $750 shortfall. As explained, the FLC adjusts the level of booked investment in the denominator to bring it to the lower level of TELRIC investment reflected in the modeled network.[148/] The FLC "merely tries to restore a 'twice-TELRICed' cost calculation to one that recognizes TELRIC only once."[149/] Once that adjustment is made, applying the ACF will in fact produce the forward-looking expense amount of $1,000, and not an artificially reduced figure.[150/] As the Massachusetts Department of Telecommunications and Energy concluded, this is both appropriate and necessary: "We agree with Verizon that as forward-looking expenses are used in the numerator, it is only logical to adjust the denominator (the current investments) by the FLC to make it forward-looking."[151/]

There is no basis for AT&T's claim that Verizon NW should have applied a current cost to book cost ("CC/BC") ratio to booked investment rather than the FLC. A CC/BC ratio is not appropriate because it can only produce the current cost of reproducing the investment in the embedded network — not the *forward-looking* TELRIC investment amounts.[152/] Applying a CC/BC therefore would not calibrate the ACFs so that they can be properly applied to the

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[148/] Exh. No. 228TC 100:4-101:Table B (Verizon Panel Rebuttal). When the .25 FLC ($10,000/$40,000) is applied to the denominator of the .025 non-FLCed ACF ($1,000/($40,000 x .25 FLC)), the result is the appropriate forward-looking ACF of .10.

[149/] *Recommended Decision* at 44.

[150/] Mr. Lundquist erroneously claims that the FLC "divorce[s] the calculation of [Verizon's] expenses from the network redesign that goes on within the investment side of the model" because it ensures recovery of the identified level of expense. Tr. 876:14-16. To the contrary: As explained, because the ACFs are applied to the forward-looking modeled investment, the overall expenses produced reflect the forward-looking plant and technology mix. The FLC simply ensures that for any *unit* of plant or technology, the correct forward-looking expense is recovered.

[151/] Order, *Investigation by D.T.E. on its own Motion into the Appropriate Pricing based on Total Element Long Run Incremental Cost, for Unbundled Network Elements and Combination of Unbundled Network Elements, and the Appropriate Avoided Cost Discount for Verizon New England, Inc. d/b/a Massachusetts Resale Services in the Commonwealth of Massachusetts*, D.T.E. 01-20, at 97 (Mass. D.T.E. July 11, 2002).

[152/] Exh. No. 1001TC 12:12-15, (Lundquist).

forward-looking investment used in the TELRIC studies, which is different from (and typically lower than) current network investment. Thus, at most a CC/BC would be a half measure. Another adjustment, akin to the FLC but slightly adjusted, would still be necessary to make the ACFs relevant for a TELRIC study.

More important, however, the use of CC/BC ratios is even more distorted than the "double TELRICing" that occurs in the absence of the FLC, because almost all of the relevant CC/BC ratios are greater than one.[153/] They therefore increase the investment denominators (and lower the value of the ACFs). But since TELRIC investment tends to be *lower* than booked investment, *increasing* the investment level in the denominator of the ACFs only exacerbates the mismatch between the ACFs and the modeled TELRIC investment.

B. GDP-PI v. CPI

As noted above, one of the adjustments Verizon NW makes to ensure that its expenses are appropriately forward-looking is to adjust for productivity and inflation. AT&T's criticisms of Verizon NW's inflation adjustment are just as baseless as its criticisms of Verizon NW's productivity adjustments. AT&T argues that Verizon NW should have used the Gross Domestic Product Price Index ("GDP-PI") to calculate expected inflation for the five non-labor-driven expense accounts included in Verizon NW's ACFs, rather than the CPI.[154/] There is no basis for AT&T's criticisms of the CPI that Verizon NW uses for the five non-labor-driven expense accounts included in Verizon NW's ACFs. The expenses in Verizon NW's model correspond

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153/ *See* Verizon Exh. No. 225, CD #2 (filed June 26, 2003) / 6. Factors Support Files / Expense Factor & Loading / Washington 2001 UNE Expense Factor and Loading Documentation.pdf / Workpaper 3.1.

154/ Exh. No. 1001TC 30:2-8, (Lundquist).

with expenses that the CPI specifically measures, whereas the GDP-PI is overly broad and measures different and inconsistent data. In any event, the CPI is widely used and reliable.[155/]

C. Other Issues

1. Verizon NW Adjusts Its TELRIC Expenses to Remove Retail-Avoided Costs.

In addition to adjusting its booked expenses to make them forward-looking, Verizon NW also adjusts its expenses to remove costs associated with retail services ("retail-avoided costs"), as required by the FCC.[156/] While AT&T agrees with the need to remove retail-avoided costs, its constant refrain is that Verizon NW should have treated more costs as avoided, and reduced expenses further. But while AT&T devotes pages to these arguments, its adjustments and criticisms amount to nothing. This is because the accounts Verizon NW includes in its UNE expense studies contain almost no retail-avoided costs to begin with.

To identify retail-avoided costs that should be removed from its expenses, Verizon NW determined that a majority of these costs were in the expense accounts for product management, sales, and customer services. It then conducted a survey of all the work centers that book costs to those expense accounts to determine the retail-related costs that Verizon NW would avoid in a wholesale-only network. It also removed a portion of testing expenses related to avoided retail trouble dispatches based upon review of sub-account detail in Account 6533.

Mr. Lundquist does not quarrel with the fact that most of Verizon NW's accounts include no retail-avoided costs at all. But he quibbles with the percentage of expenses that Verizon NW removed from its marketing accounts, arguing that more should have been taken out. He first

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155/ Exh. No. 228TC 118:4-11, (Verizon Panel Rebuttal).

156/ 47 C.F.R. § 51.505.

suggests that the percentages are wrong because Verizon NW's avoided cost study was performed in 1997.[157/] But the vintage of the data hardly proves that the study *understates* percentages of retail-avoided costs. Verizon NW's wholesale business has grown substantially since 1997, and wholesale-related costs are necessarily a greater percentage of the costs in any relevant account than they were seven years ago. As a result, the percentage of any such account that should be treated as retail-specific inevitably should have shrunk.

Mr. Lundquist suggests that the Commission should use the combined consumer and business headcount percentages from a Verizon land and building administrative employee headcount study as a surrogate for the retail-avoided percentage in Verizon NW's marketing accounts for UNE purposes.[158/] This would lead to wholly unreliable results. The headcount study was not designed to record whether an employee's work was truly (and exclusively) consumer or business related. As Verizon NW has explained, that study assigned headcount into the consumer, business, carrier, operator services, and marketing other line-of-business cost pools based on general descriptions of the corporate department that paid the individual employee.[159/] And many employees — such as product managers, for example — perform tasks for both retail business and wholesale carrier products, *regardless* of the "classification" of their corporate department.[160/] Further, some of the work "retail"-related employees perform in the network today would be performed, albeit with a different target market, in a wholesale-only

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[157/] Exh. No. 1001TC 23:12 24:2, (Lundquist).

[158/] *Id.* at 25:19 26:9.

[159/] *Id.* at 113:18-114:12

[160/] *Id.* at 114:2-5.

network, as well.[161/] Mr. Lundquist's assumption that in a wholesale-only world, Verizon NW could "avoid" all wages and related activities associated with employees that the headcount study assigned to a "consumer" line of business is therefore entirely erroneous.[162/]

Verizon NW did not adjust its 6613 account (product advertising) to remove advertising expenses, but instead treated retail advertising as a surrogate for the advertising expenses that a wholesale-only company of Verizon NW's size would incur. This amount involves less than 9 percent of Verizon NW's total marketing expenses, and only *0.4 cents* of the expenses loaded onto a dollar of operating expenses.[163/] But Mr. Lundquist's claim that this is an effort to recover retail-related costs[164/] is wrong. There is no concrete measure of the advertising budget of a wholesale-only telecommunications company of Verizon NW's size, because none exists. Thus, UNE-related advertising costs must be hypothesized based on some measure of real-world costs. It is reasonable to extrapolate from Verizon NW's *retail* advertising budget, since that is a fair measure of what a company would spend on advertising its core business offerings.[165/]

There is no question that Verizon NW would advertise UNEs if those were its sole business. As Verizon NW witness Mr. Jones stated, "If [Verizon NW] were a wholesale only

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161/ *Id.*

162/ Moreover, Mr. Lundquist incorrectly treats the headcount percentages for "Operator Services" and "Marketing Other," as "avoided" rather than wholesale-related, contending that "Verizon's study already performs assignments of marketing expense to Operator Services and Marketing Other." Exh. No. 1001TC 26:5-9, n.42, (Lundquist). As a result, where the consumer and business headcounts amounted to 62 percent of the total prior to the adjustment, after the adjustment they amount to 85 percent. Exh. No. 228TC 115:19-14, (Verizon Panel Rebuttal). This adjustment makes no sense. Verizon NW does not assign expenses to the Operator Services and Marketing Other cost pools until *after* it has applied the retail-avoided percentages to each of the expense accounts for sales, product management, and customer services. *Id.*

163/ Exh. No. 228TC 111:8-11, (Verizon Panel Rebuttal). The Marketing Loading is 4.45 percent, or a loading of 4.5 cents for every dollar of operating expenses. Nine percent of the 4.5 cents is .4 cents.

164/ Exh. No. 1001TC 20:19-21:2, (Lundquist).

165/ Exh. No. 228TC 110:17-11:15, (Verizon Panel Rebuttal).

company, that would be our only business, and we would try to increase and maintain our sales as best we could, advertising being one of those avenues."[166/] Indeed, as competitors have begun to bypass Verizon's network using VoIP and wireless, Verizon already has begun actively to promote its wholesale offering, "Wholesale Advantage," to CLECs.[167/] A wholesale-only company would also participate in general product advertising in order to stimulate demand for its wholesale offerings. As Commissioner Showalter pointed out and Mr. Lundquist agreed, "[consumers] certainly understand there's different . . . choices in telecommunications services, and some of them are based on land line, some are not."[168/] Almost every company incurs some advertising costs, and a wholesale UNE company, facing the erosion of its business by competing cable, VoIP, wireless providers, and facilities-based CLECs, could reasonably be expected to engage in a substantial amount of advertising to grow or at least retain its business. Since the only advertising budget data available to Verizon NW is its own, that is a reasonable proxy for the wholesale product advertising that a UNE company would be expected to undertake.

V. MODEL OVERVIEW: CHOICE OF MODEL

The parties in this case have proposed two very different cost models: VzCost, a new Internet-based model proposed by Verizon NW, and HM 5.3, a revised version of the HAI cost model proposed by AT&T in earlier cost dockets in Washington. There are no decisions yet addressing VzCost. In the only decision that has addressed HM 5.3, the California ALJ recently concluded that the Model "fail[ed] the Commission's cost modeling criteria" and did not clearly

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166/ Tr. 822:25-823:3 (Jones).

167/ Exh. No. 228TC 110:16-18, (Verizon Panel Rebuttal).

168/ Tr. 888:5-8 (Chairwoman Showalter).

explain and allow modification of its inputs.[169/] A number of different commissions — including this Commission — have refused to accept earlier versions of the HAI model.[170/]

A. The Importance of Selecting the Right Model

At the outset, the Commission has asked the parties to address the question whether the selection of one model over another is necessary or important, given the ability of the Commission to modify model inputs.[171/] As discussed below, to ensure that it adopts meaningful, accurate and verifiable UNE rates, the Commission should be concerned both with the selection of the appropriate cost model and with the right inputs.

Dr. Mercer, AT&T's consultant, concluded that "it's still worth getting the model right."[172/] First, as Mr. Spinks pointed out, selecting a model "gives some certainty to the process of determining costs for future purposes."[173/] As the FCC has recognized, establishing

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169/ Proposed Decision of ALJ Duda, Joint Application of AT&T Communications of California, Inc. (U 5002 C) at 255 and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Network Element Costs Pursuant to Paragraph 11 of D.99-11-050, Docket Nos. 01-02-024, 01-02-035, 01-02-031, at 230 (Cal. P.U.C. May 3, 2004) ("*SBC California Proposed Decision*").

170/ Seventh Supplemental Order, Docket No. UT-980311(a) (Aug. 26, 1996) ("*Seventh Supplemental Order*"); *Eighth Supplemental Order*; Thirteenth Supplemental Order, Docket No. UT-023003 (Sept. 8, 2003) ("*Thirteenth Supplemental Order*"); Fourteenth Supplemental Order, Docket No. UT-023003 (Oct. 14, 2003) ("*Fourteenth Supplemental Order*"); Eighteenth Supplemental Order, Docket No. UT-023003 (Dec. 5, 2003) ("*Eighteenth Supplemental Order*"); Final Order, *Investigation by the Department of Telecommunications and Energy on its own Motion into the Appropriate Pricing, based upon Total Element Long-Run Incremental Costs, for Unbundled Network Elements and Combinations of Unbundled Network Elements, and the Appropriate Avoided-Cost Discount for Verizon New England, Inc. d/b/a Verizon Massachusetts' Resale Services in the Commonwealth of Massachusetts,* D.T.E. 01-02 (July 11, 2002) at 47-53; Decision and Order, *In the Matter of the Board's Review of Unbundled Network Elements Rates, Terms and Conditions of Bell Atlantic-New Jersey, Inc.,* Docket No. TO00060356, (Mar. 6, 2002) at p. 25-30 ("*New Jersey Order*"); Order on Unbundled Network Element Rates, *Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements*, Case 98-C-1357 (Jan. 28, 2002) at 14-15, 17.

171/ *See* e-mail of June 23, 2004 from ALJ Theodora Mace setting forth briefing outline.

172/ Tr. 1642:3-14, (Mercer).

173/ Tr. 1065:24-25 (Spinks).

appropriate UNE rates in such cost dockets is an "extremely complicated task."[174/] There is thus substantial public interest in simplifying "these complicated and time-consuming proceedings" so as to avoid "divert[ing] scarce resources from carriers that otherwise would use those resources to compete in local markets."[175/] In addition, model choice can affect results; as Dr. Mercer pointed out, for example, the choice of model may well have more significant effects at the density zone level.[176/]

Most important in this case, however, is the difference between these two models with respect to what the FCC has characterized as their ability to "more closely account for the real-world attributes of the routing and topography of an incumbent's network."[177/] This core difference was the subject of extensive inquiry at the hearings concerning the characteristics of the "ideal" model.[178/] Prior Commission decisions similarly identify as an important modeling consideration the ability of cost models to serve as reasonable (albeit simplified) representations of "the complexity of the real world."[179/] Indeed, the Commission has repeatedly required validation of cost models based on a comparison of their average loop lengths to those in the incumbent's actual network, based on the goal of "building a cost model that reflects *actual operating characteristics*."[180/]

174/ *TELRIC NPRM,* ¶ 39.

175/ *Id.* ¶ 7.

176/ Tr. 1642:14-17, (Mercer).

177/ *TELRIC NPRM,* ¶ 52.

178/ *See, e.g.,* Tr. 1610:25-1635:20, (Chairwoman Showalter).

179/ *Eighth Supplemental Order,* ¶ 21.

180/ *Thirty-second Supplemental Order,* ¶ 346 (June 21, 2002) (quoting Verizon NW) (emphasis supplied). *See also Eighth Supplemental Order,* ¶ 227.

The core principle of the VzLoop model within VzCost is the value of recognizing both the constraints of real world locations, and the efficiencies derived from relying on the rights-of-way associated with those existing locations. In contrast, HM 5.3 relies on a deeply flawed and convoluted preprocessing procedure that ignores actual customer locations and instead spreads them uniformly within rectangular shaped clusters (the Model's surrogate for distribution areas). HM 5.3 then attempts to "normaliz[e]" the resulting distribution cable distances with a so-called strand distance multiplier.[181/] This multiplier, however, not only is insufficient in correcting HM 5.3's inaccuracies, it also is an entirely inadequate benchmark for proper loop lengths. The strand distance bears no relation to real world constraints or to the difficulties of obtaining rights-of-way[182/] — even though Dr. Mercer conceded in response to Chairwoman Showalter's questions that an ideal model would take account of such factors. [183/] In the California SBC UNE case, the ALJ recognized HM 5.3's deficiency in this respect, and concluded "that the use of [the ILEC's] actual right-of-way and plant routes would be a superior modeling technique."[184/]

This significant difference between VzCost and HM 5.3 has very real consequences that cannot be undone simply by changing inputs. As noted in greater detail below, by relying on artificially large distribution areas HM 5.3 substantially distorts the appropriate allocation between feeder and distribution cable. And since HM 5.3 attaches significant differences in

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[181/] Tr. 1599:17 (Mercer).

[182/] *See, e.g.*, Exh. 601T at 29-30 (SAI located in the middle of Lake Chelan).

[183/] Tr. 1611:19-1612:25 (Mercer). On redirect examination, Dr. Mercer attempted to qualify this concession by limiting the importance of considering rights-of-way to "a case where I did want to run where there was a right of way." Tr. 1664:19-20. As noted below, however, the signal defect of HM 5.3 is that *in no case* does it seek out existing rights-of-way.

[184/] *SBC California Proposed Decision* at 64. *See also* Memorandum Opinion and Order, *Joint Application of BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance for Provision of In-Region, InterLATA Services in Georgia and Louisiana*, 17 FCC Rcd 9018, ¶ 36 (2002) ("*BellSouth Georgia/Louisiana § 271 Order*").

structure sharing and structure type between feeder and distribution, *the choice of the model affects the choice of the inputs.*[185/] Similarly, by not routing cable along feasible network routes, the proper allocation between feeder and distribution is further distorted. Cable size and type (i.e., fiber versus copper) are modeled incorrectly, with cables inappropriately sized to accommodate only the demand that they currently serve.[186/] Splicing points are also in error. As illustrated by Mr. Dippon, HM 5.3 fails to model a sufficient number of splicing points, and thus significantly understates splicing investments.[187/] Finally, as noted below, because HM 5.3 does not and cannot utilize information on existing structure mix, it must therefore rely on arbitrary and unsupported assumptions about the mix of aerial, buried, and underground plant in different density zones (and equally arbitrary assumptions about the different degrees of sharing they may accommodate). In short, HM 5.3 merely makes guesses or unfounded assumptions concerning the mix of distribution and feeder plant, the amount of sharing, and the layout of the modeled network. HM 5.3 is therefore not TELRIC-compliant because it does not produce estimates of the forward-looking costs *any* carrier expects to incur in provisioning UNEs. Similarly, because HM 5.3 ignores real-world constraints and the value of existing network locations, its results cannot reflect the costs of the resources society uses in providing telecommunications services, and therefore the resulting rates cannot be deemed to be economically efficient. By comparison, VzLoop starts with the existing structure type on each route segment and therefore reflects the decisions Verizon's engineers have found to be consistent with local constraints such as zoning

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185/ *See* Exh. 601T at 32; Exh. 551TC 59-61.

186/ Exh. No. 551TC 77:6-78:6; 101:1-103:17, (Murphy); Exh. No. 501T 18:20-19:7; 26:11-27:11, (Tardiff).

187/ Tr. 1447:10-1448:4, (Dippon) ("it's the wrong cable size, it's the wrong splicing points, [HM 5.3] omits so many facts it just becomes very unreliable.").

requirements, safety considerations, and congestion.[188/] Likewise, VzLoop's use of information about existing network locations helps insure that the results correspond to the forward-looking costs it will incur and reflects the economic value of those locations. Because the type and nature of the inputs is driven by the model chosen, Verizon NW believes that it is important that the Commission accepts the appropriate cost model in this case, as well as the right inputs. Moreover, because HM 5.3 is seriously flawed and cannot produce either TELRIC-compliant costs or economically efficient rates, both the model and its outputs should be rejected by the Commission. The Commission should instead accept VzCost.

B. Openness and Flexibility of VzCost and HM 5.3

In the *Eighth Supplemental Order*, the Commission reiterated its prior determination that an open model serves the public interest by "provid[ing] all parties with an opportunity to fully explore the advantages and the limitations" of the model.[189/] To qualify as an open model, the model must allow parties "to have the ability to understand assumptions used, to review and analyze the effect of inputs and outputs, and to modify and model different inputs and assumptions."[190/] To satisfy these criteria, the Commission requires model proponents to provide interested persons with "the opportunity to review both the compiled and uncompiled source codes," to provide "support for input values," to include "a narrative description of how the

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188/ *See* Exh. No. 451T at 3-8, 18-19.

189/ *Eighth Supplemental Order*, at ¶¶ 24, 507.

190/ *Id*. n.11, *quoting* Ninth Supplemental Order, Docket No. UT-950200 (Oct. 19, 1995), at 2. *See also TELRIC NPRM*, ¶ 41, (noting that "the logic and algorithms of a cost study or cost model should be revealed to and understandable by the parties and regulators").

model operates," and to ensure that the model is "susceptible to modification and sensitivity analysis."[191/]

As shown below, VzCost is the only model in this proceeding that satisfies these requirements. As an Internet-based model, VzCost and its associated cost studies offer unique advantages in providing ready access to interested parties.[192/] In accordance with the requirements of the *Eighth Supplemental Order*, Verizon NW has also filed extensive documentation on VzCost. It has conducted a number of training sessions that were available to all interested parties and to the Commission's staff and advisor,[193/] and established a help desk to aid in fielding systems questions from VzCost users.[194/] And in stark contrast to AT&T, Verizon NW has made available all of the various compiled and uncompiled source codes used in its new loop model.[195/]

The parties also have "the ability to understand assumptions" used in VzCost. As a threshold matter, the algorithms used in VzCost do not require understanding of computer languages at all; rather, they employ user-adjustable equations, the logic of which can be easily

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191/ *Id.* at ¶ 26.

192/ These include the ubiquity of Internet access, the ability to incorporate unprecedented amounts of real-world data through a server rather than a PC based system, the capability of easy sharing among users, and ready access to cost study documentation and historical cost information. Exh. No. 201TC 15-16; Exh. 228TC 19.

193/ *See* Exh. No. 201TC, CD Nos. 2, 7, and 10, Exh. No. 226T, CD No. 2 & Exh. B; Tr. 1035-1036. *See also Twentieth Supplemental Order* at 3.

194/ *See* Tr. 1036:1-8 (Spinks); *Fifteenth Supplemental Order* at 5. *See also* Tr. 1240:10-13 (Harris). Verizon NW has also imposed strict confidentiality obligations on any database administrator or Help Desk personnel who gains access to cost model information of other parties, pursuant to procedures approved by the Commission in the *Sixteenth Supplemental Order* (attaching Letter from AT&T Describing Verizon Help Desk confidentiality policy).

195/ *See* Exh. No. 226T, CD No. 3.

understood even by those not versed in computer languages.[196/] AT&T does not, and cannot, argue that these formulas are in any sense a "black box."[197/]

However, AT&T does claim that one aspect of VzCost — VzLoop — is so complex that the expert retained by AT&T in this particular case could not understand it easily enough.[198/] This is simply wrong. To a cost study expert experienced in analyzing loop cost models, there is nothing mysterious about the VzLoop source code or computer language. VzLoop is written in a later version of the same well-known computer language that has been used in the Modified Synthesis Model, proposed by AT&T in other proceedings.[199/] Thus, it is highly unlikely that AT&T would be stumped by a model using that same language. In fact, AT&T's consultant (who participated in similar meetings and workshops concerning VzLoop)[200/] conceded that he was able to trace the VzLoop source code logic so as to suggest the need for a revision of that logic relating to the calculation of the fiber-copper economic cross-over point.[201/] There is simply no credible argument that AT&T did not have, or could not have retained, experienced experts

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196/ *See* Exh. No. 228TC 3.

197/ *See* Tr. 1180:14-18 (Turner).

198/ *See* Exh. No. 751TC 13. There is no small irony to AT&T's claim about the complexity of VzLoop, given the complexities of HM 5.3. Exh. No. 503 at 11-12, 14.

199/ *See* Exh. No. 228TC 7. The modified synthesis model was written in TurboPascal, which is a slightly older "Delphi" version of Pascal than the one used by in VzLoop. *See* Order, *In the Matter of Federal-State Joint Board on Universal Service*, 18 FCC Rcd 44, ¶ 7 (2003).

200/ Tr. 1190:5-1191:20 (Turner).

201/ Tr. 1168:22-1170:16, 1173:22-25 (Turner).

who had "the ability to understand assumptions" in VzLoop as required by the *Eighth Supplemental Order*.[202/]

Finally, VzCost (and each of its modules, including VzLoop) satisfies the Commission's requirement that users can "modify and model different inputs and assumptions."[203/] As noted above, all of the equations used by VzCost to calculate costs can be changed (or entirely replaced) by the user. Interested parties also have all of the tools needed to test and run sensitivities on source code changes.[204/] Inputs can be changed just as easily. With respect to VzLoop, for example, one can change any material or placement cost simply by entering new values into the material, placement, options, elements, loop constants, demand, master, or network table.[205/] Indeed, because the network table contains the location of every terminal in the modeled network, and every linkage between them, a user can entirely redesign the modeled network by changing the values in this table.[206/] Thus, the complaint of AT&T's consultant that it was impossible to change serving area interface ("SAI") locations[207/] is not credible: he could have done so by modifying the network table, as Verizon had demonstrated to him at a meeting

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202/ While Staff challenged the ease of use of VzCost, Mr. Spinks conceded that he had not reviewed the VzLoop manual included with Verizon NW's filing, accepted any of its offers to provide him with further training, or taken any other measures to familiarize himself with the new model. Tr. 1034:23-1036:24; 1039:2-20 (Spinks).

203/ Mr. Spinks conceded as much on cross-examination, in particular with respect to VzCost's ability to change structure sharing assumptions and adjust loop lengths. Tr. 1037:2-1041:24 (Spinks).

204/ Exh. No. 228TC 14.

205/ *See* Exh. No. 228TC 11.

206/ *Id.*

207/ Exh. No. 751TC 37.

over two months before he filed his testimony.[208/] Thus, VzCost satisfies all of the Commission's standards for an open and transparent model.[209/]

In contrast, HM 5.3 is neither open nor transparent. In direct violation of the Commission's cost modeling criteria, and in defiance of repeated orders by the ALJ and the Commission to produce all of the processes yielding the HM 5.3 cluster input database (including the clustering source code),[210/] AT&T has refused to allow Verizon NW, the Commission, or any other party the right to access and review the most critical aspects of HM 5.3's preprocessing.[211/]

As Mr. Dippon explained, absent access to the clustering source code, Verizon NW cannot fully understand the complex preprocessing conducted by TNS and make changes to the multitude of hard-coded values within the clustering process.[212/] This is especially significant in light of AT&T's failure to demonstrate that HM 5.3's cluster input database lives up to its

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208/ Tr. 1190:5-1191:23 (Turner). *See also* Tr. 1229:1-7 (Harris).

209/ AT&T's complaint about occasional systems issues associated with its initial use of VzCost is trivial. First, AT&T notes that Verizon's web-based platform (like any such service) must on infrequent occasions be shut down on a weekend or late evening for system maintenance. See Exh. No. 751TC 19. But AT&T identified only one such instance in the three months before it filed its testimony, and that weekend downtime had been instituted in order to provide an enhancement for user sharing at the request of (and with over a month's advance notice to) AT&T's own affiliate in California. Exh. No. 228TC 17**.** Second, AT&T criticizes the time alleged to be required in VzCost for uploading or downloading information. Yet AT&T cites only two occasions on which it experienced any difficulty uploading or downloading such files in this proceeding. In the one case, a download solution was provided within three hours of AT&T's call to the help desk. *See* Exh. No. 751TC at 19. The other (involving uploading files) was an isolated occurrence, since even the largest files in this case generally take no more than 15 minutes to upload, and Verizon NW has identified simple ways to upload larger files. Exh. No. 751T at 18-19.

210/ See *Thirteenth Supplemental Order*, ¶¶ 13-17 (ordering AT&T to produce TNS clustering information and stating that without TNS information AT&T may not be "transparent and readily capable of verification.").

211/ Tr. 1379:17-1380:7 (Dippon); Exh. No. 601T at 8-11, 34-35, (Dippon); Exh. 503 at 10.

212/ Tr. 1386:19-1387:13 (Dippon).

billing, and its admission that it has never even checked the accuracy of the database.[213/] In addition, some of HM 5.3's key cost drivers and inappropriate engineering assumptions are buried or hardcoded in its preprocessing platform and algorithms, thereby making them impossible to analyze and modify.[214/] Moreover, AT&T has never provided explanations of how to modify some of HM 5.3's key modeling assumptions.[215/] Under the standards of both the *Eighth Supplemental Order* and the Commission's prior orders requiring production of model information AT&T has steadfastly refused to provide, HM 5.3 should be rejected.

C. Metrics for evaluating reasonableness of model

1. Route miles

Route miles (e.g., the lengths of distribution facilities between an SAI and customer locations) are one determinate of cost. As noted below, because HM 5.3's average loop lengths bear no relation to reality, that model fails all of the Commission's most important validation tests. But no less important are *where* loops facilities are placed, and *what type* of facilities are placed. In this regard, HM 5.3 is clearly inferior to VzCost. Not only does HM 5.3 place a disproportionate amount of outside plant in low-density areas, but, as Mr. Dippon's maps demonstrate, it fails miserably at placing the proper amounts of facilities on the roads along which a real-world carrier would build plant to reach actual customers.[216/]

213/ Exh. No. 601T at 33. In fact, as Dr. Mercer admitted during the hearings, none of the model sponsors or anyone at AT&T has ever reviewed the clustering algorithm. Tr. 1496:21-1498:2 (Mercer and Fassett); Tr. 1660:8-10 (Mercer).

214/ Exh. No. 551TC 23-25, (Murphy); Exh. No. 601T 36, (Dippon); Exh. No. 503 15, (Tardiff).

215/ Exh. No. 551TC 23.

216/ *See* Exh. No. 601T, Exhibits CMD-6 and CMD-12.

AT&T's argument that HM 5.3 deploys longer loop lengths than VzLoop, and thus is somehow conservatively superior, fundamentally misses the mark. Much more important to the determination of total investment and the resulting UNE costs is the mix between feeder and distribution cable.[217/] As Mr. Dippon demonstrated, HM 5.3's feeder lengths are significantly shorter than those modeled by VzLoop, and as Mr. Murphy described, HM 5.3's feeder cost per foot is significantly higher than its distribution cost per foot.[218/] While AT&T's own engineering guidelines (and, likewise, those of Verizon) recognize the need to establish distribution areas that correspond "with streets, property lines, railroads, river and creeks, or fence lines,"[219/] HM 5.3 radically departs from these guidelines and establishes excessively large distribution areas that ignore these real-world constraints.[220/] These artificially large distribution areas, in turn, substantially distort the appropriate allocation between feeder and distribution cable, effectively substituting substantial amounts of low-cost distribution plant for what should be more expensive (and largely unshared) underground feeder structure.[221/]

Equally important are the types of cable the model installs, the supporting structure (i.e., aerial, buried, or underground) that is used, and where that equipment is located.[222/] Here again, HM 5.3 ignores reality and assumes that generally only two types of cables and cable sizes are

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217/ Exh. No. 501T at 24.

218/ Specifically, HM 5.3 models 33 percent *less feeder* than VzCost's loop investment calculator, VzLoop (14,983,127 feet and 22,399,682 feet, respectively). Exh. No. 601T 64; *see also* Exh. No. 503 at 21-22.

219/ *See* Exh. No. 956TC 11; Exh. 451T at 6.

220/ Exh. No. 501T at 26.

221/ *Id.* at 24; Exh. No. 601T at 63-64. AT&T also ignores the significant maintenance expenses associated with the more extensive distribution cable it models. Exh. No. 228TC 44.

222/ Exh. No. 601T at 64; Tr. 1422:11-20 (Dippon) ("[A]ll that boils down to is that the distance is not the only issue that we ought to be looking at. We ought to be also looking at the cable type, size.").

used to serve the lots in its distribution areas.[223/] Moreover, by placing excessive amounts of plant in the less dense areas, HM 5.3 produces relatively higher costs in low-density areas and relatively lower costs in high-density areas targeted by AT&T.[224/] In short, the fact that HM 5.3 produces more route miles than VzLoop says nothing about whether it produces sufficient quantities of the correct types of outside plant, or whether the cost estimates produced thereby reasonably represent what Verizon NW can expect to incur on a forward-looking basis.[225/]

2. Average loop length

The Commission has repeatedly emphasized the need for cost models to "produce[] loop lengths that comport with actual loop lengths."[226/] It has required parties to address the relationship between their cost studies' average loop length estimates and their actual average loop lengths,[227/] and to "explain the basis for the differences," in order to "validat[e]" the accuracy of their models.[228/]

Verizon NW's loop model does a substantially better job in estimating the average loop length than any other model presented before this Commission, in this proceeding or earlier dockets.[229/] In fact, the average individual wire center ratio of *modeled* loop lengths in VzLoop

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223/ Exh. No. 601T at 4 (recognizing that HM 5.3 ignores the numerous cable types and sizes deployed in real-world networks); Exh. No. 503 at 2.

224/ Exh. No. 501T at 30, 74-75; Exh. No. 503 at 22. *See also* Tr. 1410:15-18 (Tardiff) ("[T]he HM model puts a lot of distance in the less dense areas relative to Verizon's model. And if that's the case, then you might not get the right pattern of prices even though the overall levels could be okay."); Tr. 1424:8-14 (Tardiff).

225/ Exh. No. 601T at 63-64.

226/ *Thirty-Second Supplemental Order*, ¶ 345.

227/ *Eighth Supplemental Order*, ¶ 227.

228/ *Ninth Supplemental Order*, ¶ 49.

229/ Tr. 1231:14-17 (Tucek); Exh. No. 228TC 30:3, 32:3 (Verizon Panel Rebuttal).

to *actual* loop lengths is 0.9922.[230/] The same average is 1.4422 for HM 5.3.[231/] By using its real-world data, Verizon NW alone has been able to capture the constraints posed by bodies of water, rights-of-way, zoning ordinances, and other real-world factors that would necessarily affect routing of loop facilities in a forward-looking network in Washington.[232/] Verizon NW also demonstrated that VzCost could be modified to reflect the small discrepancy between the modeled and actual loop lengths, while noting that doing so would result in only a 1.4 percent decrease in the statewide 2-wire unbundled loop rate.[233/]

In contrast, AT&T has not offered any evidence or testimony in support of its proposed modeled loop lengths, or made any effort to "explain the basis for the differences,"[234/] as the Commission's prior decisions require. As noted above, HM 5.3 models excessively long loop lengths on average. And as Dr. Tardiff recognized, HM 5.3 does not come close to matching the actual loop lengths present in Verizon NW's network.[235/] Performing poorly in all of Verizon NW's 99 wire centers, the average absolute relative deviation between real loops and the Model's loops was 61 percent — a figure much less precise than VzLoop's average deviation of 15 percent.[236/]

230/ Exh. 228TC 30.

231/ Exh. 228TC 30.

232/ Exh. 228TC 27-28.

233/ Exh. 228TC 34.

234/ *Ninth Supplemental Order*, ¶ 49.

235/ Tr. 1376:22-1377:3 (Tardiff).

236/ Tr. 1376:22-1377:3 (Tardiff); Spinks Supplemental Testimony at 3.

3. Adhering to current location of pedestals, cabinets, etc.

As noted above, the Commission has previously recognized that cost models should approximate "the real world."[237/] One of the greatest advantages of VzLoop, as compared to HM 5.3, is the extent to which it does just this, particularly with respect to pedestals (also referred to as distribution terminals) and cabinets (also referred to as SAIs and remote terminals). VzLoop relies on actual information about real-world facility locations to accommodate the locations of real-world DLCs and distribution areas. It also relies on data about control points in the real-world network to model feeder routes and additional SAIs and DLCs under appropriate circumstances.[238/] For a more comprehensive discussion of Verizon NW's modeling of loop facilities, see Part VI.B, *infra*. Other Commissions have consistently recognized that "an appropriate calculation of [an ILEC's] forward-looking costs should reasonably capture the network design and layout of [its] network."[239/]

4. Number of lines in a serving area

By relying on the real-world constraints, VzLoop models distribution areas ("DAs") that generally conform to the long established industry guideline of 200 to 600 living units per distribution area.[240/] HM 5.3's clusters, on the other hand, rely on TNS's undisclosed clustering

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[237/] *Eighth Supplemental Order*, ¶ 21.

[238/] Exh. No. 451T at 3-5.

[239/] Decision and Order, *In the Matter of the Board's Review of Unbundled Network Elements Rates, Terms and Conditions of Bell Atlantic-New Jersey, Inc.,* Docket No. TO00060356, (Mar. 6, 2002) at 12 ("*New Jersey Order*"). *See also Indiana Decision* at 29; Order, *Illinois Decision* at 125.

[240/] See Exh. No. 265-C, Verizon Response to AT&T DR 3-007 CD, DAPD2 at 2-4.

algorithm that produces excessively large distribution areas that would be extremely difficult (if not impossible) to manage in the real world.[241/]

Earlier versions of the HAI Model (e.g., HM 2.2.2) used Census Block Groups ("CBGs") as a proxy for much smaller DAs.[242/] And AT&T's initial outside plant witness previously argued that DAs should be from 200 to 600 households, in accordance with AT&T guidelines.[243/] He has now abandoned these standards in favor of the incredible assumption that DAs can be as large as 6,451 lines, and that all of these lines can be served by a single SAI or collocated remote terminals ("RTs") and SAIs placed in a single location.[244/]

One need only examine HM 5.3's results to conclude that the clustering algorithm is not operating consistent with established practices. While there are approximately **[VERIZON NW PROPRIETARY]** **[VERIZON NW PROPRIETARY]** DAs in its Washington network, HM 5.3 builds plant to a mere 1,018 DAs.[245/] Moreover, in building to such large areas, HM 5.3 tends to select equipment sizes that are much too large.[246/] For example, while HM 5.3 produces about 1,100 SAIs averaging 2,300 lines, VzLoop produces 3,300 SAIs[247/] averaging 1,400

[241/] Exh. No. 501T at 26.

[242/] Exh. No. 601T at 33.

[243/] *See* Docket Nos. UT-960369, -370, -371, Workshop Transcript (Feb. 17, 1997) at pp. 158-59; *see also* Exh. No. 551TC 40-41 (*citing* AT&T Practice Standard, Section 901-350-201, Outside Plant Engineering, Long Range Outside Plant Planning, Issue 3 (Sept. 1983) at 20 ("The number of living units in a DA generally ranges between 200 and 600. In dense areas (for instance, 12 units/acre) the DA should contain close to the upper limit (600) of living units to improve feeder efficiency and to economically minimize the number of interfaces. In relatively sparse areas (such as, somewhat less than one unit/acre) the DA should contain a number of units closer to the lower limit (200) to avoid wasting money building excessive lengths of distribution cables.")). *See also id*. at 41 (pointing out AT&T witness John Donovan has also supported these guidelines).

[244/] Exh. No. 551TC 41.

[245/] Exh. No. 601T at 64.

[246/] Exh. No. 501T at 26.

[247/] This number does not include the more than 8,000 indoor SAIs classified as building terminals.

lines.[248] Similarly, while HM 5.3 places about 1,100 remote terminals averaging about 1,100 lines each, VzLoop places about 2,760 RTs averaging about 370 lines.[249]

As the California ALJ has concluded,[250] designing a network with longer distribution cables and shorter feeder cables is inefficient. The physical characteristics of distribution cable generally make it more susceptible to service problems, and thus considerably more costly to maintain. It is often placed on poles, always has more splice points, and is therefore more vulnerable to environmental conditions, and it is also worked on much more frequently than is feeder.[251] Yet HM 5.3 does not take account of any of these greater costs of distribution cable.[252] As noted above, by overstating the relative amount of distribution plant, HM 5.3 also understates costs through use of significantly higher sharing and less expensive structure type assumptions (which are wholly unsupported). Such an approach would fundamentally distort the cost-benefit analysis traditionally conducted by outside plant engineers – including AT&T's own outside plant guidelines.[253] Nor are such large distribution areas really practical, because of the siting requirements described by Mr. Richter.[254]

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[248] Exh. No. 501T at 26.

[249] Exh. No. 501T at 26.

[250] *SBC California Proposed Decision* at 76-77.

[251] Exh. No. 451T at 13.

[252] Exh. No. 551TC at 60-62.

[253] Exh. No. 451T at 13; Exh. 228TC 44-45.

[254] Exh. No. 451T at 13-14.

5. Maximum Length of Copper Cable

Verizon NW's 12,000 foot maximum copper loop length is consistent with the FCC's TELRIC requirements, with industry standards, with the California ALJ's draft decision[255/] — and with the prior testimony of AT&T's own initial engineering witness.[256/] This limit ensures that the modeled network will not impede the provision of advanced services (such as xDSL), by permitting transmission speeds of up to 6.1 megabits per second.[257/] It is therefore consistent with the FCC's requirements of forward-looking and efficient technology. The 18,000 foot maximum relied upon in the FCC's universal service model, and advocated by AT&T, is not relevant here: a universal service model is designed for the purpose of ensuring the delivery of only a basic level of voice service, which for UNE purposes the network must accommodate advanced services as well.[258/] The CSA design standards relied on by AT&T[259/] limit copper cable length to 12,000 feet.[260/] And most, if not all, equipment vendors default to this same standard.[261/] Consequently, any deployment of copper beyond this length would encounter significant compatibility problems.[262/]

255/ *SBC California Proposed Decision* at 193-94.

256/ Exh. No. 451T at 15.

257/ Exh. No. 201TC 45; Exh. No. 451T at 16.

258/ Even the *Virginia Cost Order* promulgated by the FCC's Wireline Competition Bureau — which, as noted above, is inconsistent with the FCC's TELRIC methodology in many respects — recognized the need for the 12,000 foot limitation to accommodate advanced services. *Virginia Cost Order*, ¶¶ 241-42.

259/ Exh. No. 851T at 39.

260/ *See Telcordia Notes on the Networks,* SR-2275, Issue 4 (Oct. 2000), at 12-4.

261/ Exh. No. 451T at 15.

262/ Exh. No. 451T at 15-16.

6. Other

Validation. In its *Eighth Supplemental Order*, the Commission emphasized the importance of evaluating whether a cost model produces valid estimates of the economic costs of providing UNEs,[263] based on algorithms that capture the salient characteristics of the network.[264] And, in establishing whether a model satisfies the requisite standard of validity, the Commission agreed that both the model's inputs and selected outputs should be subject to validation.[265] HM 5.3 repeatedly fails such tests.[266]

As Dr. Tardiff points out, one useful validation test is whether successive releases of the HAI Model are consistent with reasonable trends in the industry.[267] As AT&T and other CLECs have conceded, the costs of "loop plant . . . are not declining," and for many non-switch elements costs are rising."[268] Nevertheless, the loop costs AT&T proposes in the instant proceeding are substantially lower than those produced by previous versions of the HAI model presented to the Commission.[269] Specifically, in 1997, Version 3.1 produced a loop cost of $14.58;[270] and in this

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263/ *Eighth Supplemental Order*, ¶ 27.

264/ *Id.*, ¶ 14.

265/ *Id.,* ¶ 37.

266/ Exh. No. 501T at 4.

267/ Exh. No. 501T at 5.

268/ *WorldCom, Inc. v. Verizon Communications, Inc.*, Reply Brief for Petitioners WorldCom, Inc., the Association for Local Telecommunications Services, and Competitive Telecommunications Association, No. 00-555 (July 23, 2001) at 6 (emphasis added). *See also* Comments of AT&T Corp, FCC CC Docket Nos. 01-338, 96-98, 98-147 (filed Dec. 16, 2003) at 99-100.

269/ Exh. No. 501T at 5, 55-56.

270/ Docket Nos. 960369, -370, -371, *Supplemental Direct Testimony of John C. Klick* (February 21, 1997) (sponsoring Hatfield Model Release 3.1).

Commission's 1998 universal service proceeding, HM 5.0a produced a loop cost of $12.62.[271] This year, AT&T advocates a loop cost of $7.64,[272] which is less than 40 percent of this Commission's current rate of $20.30,[273] and 48 percent less than the loop cost produced by HM 3.1 (just seven years ago).[274] As Dr. Tardiff explained, "there's nothing that I've heard that explains why loop costs say should be only one third of what the Commission adopted as a price just a few years ago."[275]

Similarly, in just three short years, the productivity assumptions and labor rates advocated by AT&T have changed substantially.[276] For example, Mr. Fassett has proposed aerial placement rates that were five to eight times higher than those he advocated just last year.[277] There have been, however, no changes in installation procedures or labor costs that would justify these drastic changes.[278] In fact, as Mr. Murphy stated, one would have to go back about twenty-five years to find any significant changes in methods, procedures or technologies available to justify changes of the magnitude advocated by Mr. Fassett.[279]

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[271] Docket No. 980311(a), *Direct Testimony of Robert Mercer on behalf of AT&T & MCI* (June 15, 1998) (sponsoring HAI Model, Release 5.0a).

[272] During the hearings, AT&T slightly increased its loop proposal by less than $1. Tr. 1477:25-1478:19 (Mercer).

[273] *See* Thirty-eighth Supplemental Order, Docket No. UT-003013, ¶ 148 (issued Sept. 23, 2002) (adopting $20.30 statewide direct loop cost and $23.94 statewide loop rate consisting of direct and common costs).

[274] Exh. No. 501T at 56.

[275] Tr.. 1409:3-6 (Tardiff).

[276] Exh. No. 551TC 122-123.

[277] Tr. 1554:4-1558:23 (Fassett).

[278] Exh. No. 551TC 124.

[279] Exh. No. 551TC 124. *See also id.* at 128-130 (noting that there is no plausible explanation for the dramatic decrease in switch room size recommended by Mr. Klick).

A further validation index is whether a model includes enough equipment as well as adequate ongoing expenses to pay for the ongoing material and labor costs needed to run the network.[280/] At a minimum, as with average loop lengths, any substantial deviation between the cost model and reality should be explained with specificity.[281/] HM 5.3, however, generates widespread deviations that AT&T never explains and that cannot be explained:

- HM 5.3 hypothesizes that a brand new network could be deployed throughout Washington at investment levels that are *less than 30 percent* of the reproduction cost of Verizon NW's network.[282/] While some reduction might be expected for some facilities, such as switching, HM 5.3 makes large across-the-board reductions that are not supported by a shred of record evidence.[283/]

- HM 5.3 produces investment levels that are less than 30 percent of Verizon NW's total current investment (and about 35 percent of Verizon NW's ARMIS investments),[284/] and expenses for operating the network that are about one-half (or less) of Verizon NW's current levels.[285/]

- HM 5.3 produces only 28 percent of Verizon NW's current support investment (for vehicles, office equipment, and the like),[286/] and only 50 percent of Verizon NW's current plant-specific expenses.[287/]

- HM 5.3 estimates that the total investment required to construct Verizon NW's entire network *from scratch* is only $838 million.[288/] This is only

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[280/] Exh. No. 501T at 43.

[281/] *Id.* The New Jersey Board of Public Utilities rejected HM 5.2a, and its primary concern was this same kind of disparity. *New Jersey Order* at 25-26.

[282/] *Id.* at 5-6, 39, 44.

[283/] *Id.* at 6 (same number of switch locations, serving the same customer volumes, and using the same digital switch technology, for only 56 percent of what Verizon NW incurred in 2002).

[284/] *Id.* at 44-45.

[285/] *Id.* at 39.

[286/] *Id.* at 45.

[287/] *Id.* at 46.

[288/] *Id.* at 47.

$138 million less than what Verizon NW spent on additions to its total plant in service ($976 million) just over the past six years (1997-2003).[289/]

- HM 5.3 assumes that Verizon NW could operate its wholesale operations with only about one-third of Verizon NW's labor force.[290/]

Thus, based solely on the *Eighth Supplemental Order's* validation criteria, HM 5.3 should be rejected as inherently unreliable.

Consistency With Reasonable Expectations. Despite AT&T's claim that HM 5.3 is a "highly sophisticated" costing tool,[291/] a number of important features appear to have little to no effect on the cost estimates produced by the model. Most significant among them is the number and size of clusters. AT&T touts that one of the most important changes between previous versions of the model and HM 5.3 is how the clusters are modeled.[292/] Putting aside the fact that HM 5.3's development of clusters is riddled with errors, this purportedly "state-of-the-art" modeling procedure has little to no effect on the cost estimates produced.[293/] In particular, replacing HM 5.3's clustering algorithm with the trivial clustering rule used in HM 2.2.2 — a change that increases the number of clusters by 147 percent (from 1,019 clusters to 2,517 clusters) — has only a modest impact on total loop costs (increasing them by only 10 percent,

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289/ *Id.* at 47 (also noting that, while ARMIS data suggest that Verizon NW's investment in additions to digital switches totaled about $165 million between 1997 and 2003, HM 5.3 produces only $117 million to provide entirely new digital switches for all of Verizon NW's lines).

290/ *Id.* at 53-54.

291/ Exh. No. 851T at 5.

292/ Exh. No. 851T at 21.

293/ Exh. No. 601T at 41-44; Exh. No. 551TC at 56-57. Other features also have little (to no) cost effects are: (1) the feature that is designed to optimize between aerial and buried cable placement costs (Exh. No. 501T at 68 (noting that the total decrease is so small (0.08 percent) it only reduces loop costs by a miniscule amount)); (2) the feature that is intended to take terrain into account when developing the costs of placing support structure (e.g., poles and conduit) (Exh. No. 501T at 68 (assuming the most favorable terrain conditions everywhere only decreases loop costs by 0.52 percent -- only enough to change unit costs by four cents)); and (3) the feature that makes an economic choice between fiber and copper feeder. Exh. No. 501T at 68.

from $7.87 to $8.66).[294/] As Mr. Dippon demonstrated, such results call into serious question how HM 5.3's clustering algorithm can so "profoundly improve[] the accuracy of … HM 5.3"[295/] when, if replaced by a simplistic clustering method used over seven years ago, it produces almost identical cost estimates.[296/] Furthermore, HM 5.3 is almost entirely insensitive to the number of clusters produced by the model.[297/] As Mr. Dippon explained, this finding does not mean that the clustering algorithm or the size of distribution areas have no affect on the total costs produced by the model. Rather, it means that other modeling flaws (i.e., uniform distribution of demand on equal-sized lots that reside in rectangular-shaped distribution areas) override the results of the clustering algorithm. That is, HM 5.3 is insensitive to the clustering algorithm because AT&T/MCI model outside plant incorrectly, not because the clustering algorithm is unimportant.[298/]

Moreover, HM 5.3's insensitivity to cluster size makes no sense from an engineering perspective.[299/] While one would expect that *distribution* lengths or costs should not change (because customer locations and the streets and roads along which they are located are "fixed"), the *feeder* lengths and costs should increase when the size of the cluster is decreased (because smaller clusters require more, but smaller SAIs, and thus need additional lengths and quantities

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294/ Exh. No. 601T at 41-42.

295/ Exh. No. 851T at 21.

296/ Exh. No. 601T at 42-44.

297/ Exh. No. 601T at 4-6, 43-50.

298/ Exh. No. 601T 44, (Dippon).

299/ Exh. No. 551TC 57:16-58:14, (Murphy).

of feeder routes).[300/] Nevertheless, although HM 5.3's feeder costs increase when the size of its clusters decreases, its distribution costs inexplicably decrease to a corresponding degree, thereby offsetting any associated increase in feeder costs.[301/] While this defies common sense, it illustrates that much of AT&T's so-called "improvements" are enhancements in name only.[302/]

VI. VERIZON'S COST MODEL

A. Overview

As noted below, the VzCost model proposed by Verizon NW is unprecedented in its ability to process vast amounts of real-world information. VzCost is also distinctive in the granular approach it uses to calculate costs. VzCost's modules (*e.g.* for loop, for switching, and for interoffice facilities ("IOF")) first calculate the investments for different portions of the modeled network, which are referred to as "investment elements."[303/] These investment elements are then converted by VzCost into larger groupings, called "basic components" (or "BCs"), that can be used to build the costs of UNEs. Finally, in accordance with the *Local Competition Order*, VzCost's "costing generator" maps the per-unit BC investments to the appropriate UNEs and then converts those investments to recurring costs by applying various annual cost factors and expense loadings.[304/]

[300/] Exh. No. 551TC 57:3-15, (Murphy).

[301/] Exh. No. 551TC 57:3-59:9, (Murphy).

[302/] Exh. No. 501T 68:1-18, (Tardiff).

[303/] Exh. No. 201TC 14:11-16:9, (Verizon Panel Direct).

[304/] *Id.*

B. Outside Plant Network Design

In the words of the FCC's former Chief Economist, VzCost has "solved the real-world problem of how to route a telephone network as efficiently as possible," by using the network locations that Verizon's engineers and planners have identified as solving such problems.[305/] It has done so by relying on "an unprecedented amount of information to model a network that identifies real-world constraints," including rights-of-way, space restrictions, security considerations, zoning ordinances, and geographical features such as bodies of water.[306/] That information, which serves as the foundation of the modeled network produced by VzLoop, allows Verizon NW to "narrow the gap between [the] model and the real world."[307/] In Chairman Showalter's words, it "introduce[s] the existing efficiencies of things that happen to be there."[308/] The ability of VzCost to incorporate these efficiencies is graphically depicted in Mr. Dippon's maps.[309/]

Verizon NW derives this data from databases that are used in its day-to-day operations, and that it therefore has a strong incentive to keep accurate and current.[310/] Verizon NW uses distribution terminal locations to derive customer locations, which allow it to provide more accurate, verifiable data about outside plant locations than would be the case if it relied on the

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[305/] Exh. No. 2T 3:2-4, (Shelanski).

[306/] Tr. 1228:19-24, (Harris).

[307/] Tr. 1230:22-23, (Tucek); *see also id.* at 1336:22-25.

[308/] Tr. 1634:3-4, (Chairwoman Showalter).

[309/] Exh. No. 601T, Exh. CMD-6, (Dippon).

[310/] Tr. 1241:4-9 (Tucek).

limited data it possesses about the actual locations themselves.[311/] Verizon NW also uses information from other operational databases for the locations of distribution terminals, SAIs, DLCs, and control points, and generally follows feeder routes used in Verizon NW's existing network.[312/] To model distribution cable routes, Verizon NW uses a minimum spanning tree algorithm that takes "a series of dots . . . that are found in the network as far as the major components are concerned" and "connects those dots to bring [the route] back to the central office."[313/]

Verizon NW's use of real-world customer locations and other actual network data does not mean that Verizon NW's loop costs reflect its "embedded" network.[314/] First, rather than using historical costs, Verizon NW uses today's equipment and installation costs.[315/] While the FCC's *Local Competition Order* prohibits the use of historical *costs*, nowhere has it precluded the use of existing *network routing*. Indeed, the FCC has found a loop study in which "cable routes . . . follow existing rights-of-way" to be TELRIC compliant.[316/]

Second, Verizon NW has made a number of forward-looking modifications to its existing network data. For example, VzLoop is designed to model the first DLC on each feeder route at the nearest of (1) the existing DLC that is closest to the wire center on that route, (2) the first SAI

311/ Exh. No. 201TC 36:8-37:4, (Verizon Panel Direct). In addition, distribution terminal locations are located no more than the length of a drop cable from actual customer locations, meaning that the location of distribution terminals are a good proxy for actual customer locations. *Id.* at 36:8-10.

312/ Tr. 1242:15-16 (Harris). A "control point" is a point in the existing network "that is in the plant records that helps an engineer monitor the network . . . it's a planning tool." Tr. 1328:19-1329:6 (Harris).

313/ Tr. 1245:21-1246:18 (Harris).

314/ See, e.g., Exh. No. 751T 3:15-4:1-7, (Turner).

315/ Tr. 531:12-23 (Shelanski); Tr. 1230:4-19 (Tucek).

316/ *Georgia/Louisiana § 271 Order*, ¶ 36.

at which the model determines that it is less expensive to place a fiber-fed DLC (including the cost of fiber cable) than copper feeder cable, or (3) the first SAI location beyond the 12,000-foot limitation for the first DLC.[317/] After the first DLC on each route is modeled, lines whose total copper loop length would otherwise exceed the 12,000-foot copper loop length restriction are designed to be served with a fiber-fed DLC.[318/]

In addition, VzLoop uses all fiber-fed DLCs.[319/] It eliminates copper for service to buildings with more than 160 lines.[320/] It sizes cables for total demand rather than reflecting the multiple cables that exist along a route in the real world (so that, for instance, a 400-pair cable is modeled even though the existing network might have one 300-pair cable and one 100-pair cable).[321/] It adds digital loop carrier facilities necessary to comply with the 12,000-foot restriction on copper loop length necessary for the deployment of advanced services.[322/] And it is based exclusively on forward-looking technologies, and not the older, legacy technologies that exist in Verizon NW's real-world network today.[323/] In other words, VzLoop not only does not model embedded costs because it uses current costs for material and labor, but also because its modeled network is not the embedded network.

317/ Exh. No. 228TC 46:6-11, (Verizon Panel Rebuttal); *see also* Tr. 1327:22-1328:6 (Tucek).

318/ Exh. No. 201TC 44:6-8, (Verizon Panel Rebuttal).

319/ Exh. No. 228TC 21; Exh. No. 226T, Attachment B (VzLoop Manual) 5-6 (Verizon Panel Supp.).

320/ Exh. No. 228TC 21:12-13, (Verizon Panel Rebuttal); Exh. No. 201TC 45:5-9, (Verizon Panel Direct).

321/ Exh. No. 228TC 21:13-15, (Verizon Panel Rebuttal); Exh. No. 226T, Attachment B (VzLoop Manual) 8-9, (Verizon Panel Supp.).

322/ Exh. No. 228TC 21:11-12, (Verizon Panel Rebuttal).

323/ Exh. No. 228TC 21:9-10, (Verizon Panel Rebuttal); Tr. 1230:4-19, (Tucek).

As the Commission has noted, cost models "are, by definition, simplifications or abstractions which omit some information."[324/] Nonetheless, AT&T has seized upon a handful of situations where Verizon NW's network data is either imperfect or missing as ostensible proof that VzCost (and, in particular, VzLoop) is riddled with "systematic errors."[325/] This is a pure distraction. Verizon NW has demonstrated that these situations are neither frequent nor of any consequence for cost modeling purposes. Indeed, as noted in Verizon's response to Bench Request No. 16, when Verizon NW made adjustments to account for all the issues identified in AT&T's rebuttal testimony and made cost-of-capital, depreciation, and structure sharing assumptions requested by Dr. Gabel, the two-wire loop investment decreased by only 2.33 percent.[326/]

VII. HM 5.3

A. Overview

As noted above, HM 5.3 does not remedy the fundamental flaws in the versions of the HAI Model previously advocated by AT&T before the Commission. While AT&T's consultant,

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[324/] *Eighth Supplemental Order*, ¶ 21.

[325/] Exh. No. 751TC 37:5, (Turner).

[326/] *See* Exh. No. 1166, WA.UT023003 Whsl UNE Loop Bench Request No 16.06082004 (Verizon NW Response to Bench Request No. 16(f)). These immaterial issues include an absence of data for a small minority of customer locations or distribution terminals, slight differences in plant records concerning the precise location of SAIs, and one DLC close to the Acme wire center as a result of a feature of VzLoop's preprocessing that can readily be revised. Exh. 228TC 38:14-52:18, (Verizon Panel Rebuttal).

At the hearings, AT&T's witness also pointed to a deficiency in the economic cross-over calculation for the placement of the first DLC along a particular feeder route. Tr. 1168:22-1169:16 (Turner). But as Verizon NW noted in its response to Bench Request No. 9, in which it made available a new version of VzLoop that corrected this feature of the VzLoop source code, "there existed no negative economic crossover in VzLoop Version 7 as filed in January 2004 in Washington," and thus "the correction of this error in the VzLoop code had no effect on the placement of DLCs, or on any other investments (or costs)." Exh. No. 1159 (Verizon NW Response to Bench Request No. 9 (Supplemental Filing of Verizon Northwest Inc. with Respect to VzLoop Version 7rA)) at 2. AT&T's expert has now agreed that "the results did not change" when he performed his own calculations with the new version of VzLoop. Confidential Statement of Steven A. Turner in Response to Verizon VzLoop 7A Filing (filed June 16, 2004).

Dr. Mercer, purports to summarize, in Attachment RAM-3 to his testimony, the basic outline of the model, as we explain below his characterizations of its alleged virtues are largely misguided.

As with VzCost, the most important feature of HM 5.3 is its modeling of outside plant. Despite having been provided substantial amounts of data detailing Verizon NW's actual customer locations, HM 5.3 assumes that all customers are spread uniformly within a rectangular DA. This process is conducted outside the model by AT&T's consultant, TNS, and (as discussed earlier) has never been made fully available to Verizon NW for review. As the ALJ in the recent California UNE proceeding correctly recognized, "The principle failure of HM 5.3 was its use of a customer location database provided by a third party, TNS, as an input."[327/]

After, discarding Verizon NW's actual customer locations when creating its clusters, HM 5.3 designs outside plant to serve these clusters through a series of arcane and convoluted "algorithms," that are inconsistent with proper cost modeling techniques and established engineering principles. HM 5.3 assumes that Verizon NW's customers are uniformly spread in rectangular-shaped DAs containing lots of equal-size and shape — assumptions that are entirely divorced from reality. The model also assumes that each of these lots has the same line demand and an identical dispersion of equal-sized distribution terminals. Both of which are assumptions that are again, utterly unrealistic. HM 5.3 ignores the numerous cable types and sizes deployed in real-world networks, employing generally only two types of cables and cable sizes to serve the lots in the rectangular DAs. It does not account for rights-of-way, and disregards entirely physical obstacles and manmade obstructions (such as rivers, highways, freeways, and mountains) when it places outside plant.[328/] Realizing that these "algorithms" yield distribution

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[327/] *SBC California Proposed Decision* at 97.

[328/] Exh. No. 601T 4 (Dippon).

route distances that are mathematically and technically not feasible, HM 5.3 employs what is referred to as "strand distance" to normalize the route distances to a measure that AT&T deems more reasonable. Even this endeavor, however, is riddled with errors.

HM 5.3's attempt to model switching costs is similarly flawed. HM 5.3 uses a cost curve that is based on switching depreciation data gathered by the FCC in 1998 for universal service purposes. This switching module is far more simplistic than that used in VzCost, and does not allow for the highly accurate and detailed modeling that is required to develop unbundled switching rates. HM 5.3 excludes costs for ISDN, SS7, and other forward-looking facilities that Verizon NW is required to provide. As noted below, it also uses flawed and outdated data.

B. Outside Plant Network Design

We address in part VIII below the flaws in the outside plant inputs relied upon by HM 5.3. But a major flaw in HM 5.3 continues to be the way in which it designs outside plant. That methodology ignores widely accepted engineering standards, network design principles, and accepted economic principles.

1. HM 5.3's Cluster Input Database Produces a Network that Is Entirely Divorced from Reality.

Perhaps the most fundamental problem with HM 5.3's outside plant network design is its failure to model plant to actual customer locations.[329/] As outlined above, although starting with geocoded and surrogated customer locations, HM 5.3 does not route its plant to any existing customer locations.[330/]

329/ Tr. 1380:13-21, (Dippon); Exh. No. 601T 39 (Dippon).

330/ Exh. No. 601T 19-20, 25 (Dippon). *See also* Exh. No. 601T 21-24, 40-41 (Dippon) (explaining how HM 5.3 has failed to keep up with the advancements in cost modeling techniques).

As a direct consequence of HM 5.3's arcane modeling techniques, and as AT&T acknowledges,[331/] HM 5.3 ignores rights-of-way and other physical and man-made obstacles when designing its outside plant.[332/] As such, HM 5.3 produces a network that bears no resemblance to Verizon NW's current (or forward-looking) network,[333/] and produces cost estimates that are significantly understated.[334/] This particular flaw is best illustrated by the maps produced by Mr. Dippon.[335/] By comparing these maps and contrasting the feeder and distribution routes produced by each cost model against the roads and physical boundaries (e.g., freeways, highways, and bodies of water) present in Verizon NW's serving area, the inferiority of HM 5.3 is evident. HM 5.3's "grills" of cables are intermingled with each other and placed without regard to feasible network routes, street layouts and topography, rights-of-way, and physical and man-made obstructions.[336/] In contrast, VzLoop routes outside plant mostly along roads, and generally avoids physical boundaries, such as lakes and other obstacles.[337/] And, rather than assume that network demand is spread uniformly across the wire centers' serving

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331/ Exh. No. 883 at Response No. 1-35 ("The customer location clusters used by the HAI Model do not explicitly account for physical obstacles such as those described in the request.").

332/ Exh. No. 601T 4, 24, (Dippon); Exh. No. 503 at 2:21-3:4, (Tardiff).

333/ Exh. No. 601T 6, (Dippon).

334/ Exh. No. 601T 28, (Dippon).

335/ Exh. No. 606; Supplemental Reply Testimony of Christian M. Dippon on behalf of Verizon Northwest Inc. (June 18, 2003), Exh. CMD-12 ("Dippon Supp. Reply"); Tr. 1380:8-1381:9, (Dippon).

336/ Exh. No. 601T 25 (Dippon); Exh. No. 606; Dippon Supp. Reply at CMD-12.

337/ Exh. No. 601T at 23-26; Exh. No. 606; Dippon Supp. Reply at CMD-12; Exh. No. 503 at 23:18-24:1, (Tardiff).

areas, VzLoop routes its plant to actual distribution terminal locations and sizes its cable according to demand at a particular network node.[338/]

Moreover, HM 5.3's simplistic use of a "grill" to model Verizon NW's distribution "backbone" and "branch cables" results in the deployment of relatively few cable sizes within the DAs.[339/] The vast majority of these cables are much larger than the cables typically deployed in the real world (as well as those modeled by VzLoop), and thus are much cheaper on a per loop basis.[340/] For example, the larger copper distribution cable sizes produced by HM 5.3 result in an average investment per pair foot that is *twenty percent lower* than the corresponding average from VzLoop.[341/]

2. The Strand Distance Multiplier Is No Miracle Fix.

HM 5.3's strand distance multiplier in no way remedies the Model's failure to account for physical and man-made boundaries.[342/] As Mr. Dippon explained, the strand distance adjustment is nothing more than a band-aid that attempts to compensate for (as opposed to fix) HM 5.3's modeling errors. In fact, the adjustment only further distorts the clusters modeled by HM 5.3.[343/] For example, as illustrated by Mr. Dippon's maps and the maps introduced by AT&T at the hearing, when the strand distance multiplier calls for less cable than HM 5.3 calculates, its rectangular clusters are compressed along both dimensions, thereby packing

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338/ Exh. No. 601T 25-26 (Dippon); Exh. No. 606; Dippon Supp. Reply at CMD-12

339/ Exh. No. 501T 26:11-27:11, (Tardiff).

340/ *Id.* at 28:1-13, (Tardiff).

341/ *Id.*

342/ Exh. No. 601T at 29 (Dippon).

343/ Exh. No. 601T 29, 62 (Dippon); Exh. No. 501T 75:3-20, (Tardiff).

customers into smaller, higher density lots.[344/] This bears no resemblance to the manner in which facilities are deployed in the real world, where cables are routed, and the specific sizes of the cables linking the distribution terminals to the SAI, to fit the unaltered layout of a DA.[345/]

Despite all this evidence, Staff undertook to correct each instance in which a cluster is misplaced.[346/] However, as Mr. Dippon explained, such an undertaking would be impossible, and necessarily result in a host of new problems.[347/] For instance, contrary to Staff's assumption, clusters that fall into bodies of water are not the only ones that must be corrected — clusters that fall into national park land, on top of mountain peaks, and across major freeways (to name just a few examples) must be remedied as well. Furthermore, even if one attempted the impossible and tried to move the misplaced clusters, such efforts would still not account for the fact that customers living outside the maximum serving distance could not be served, or that Verizon NW's customers are not spread uniformly and do not live in equal sized lots in rectangular shaped DAs. Thus, the effort that Staff purports to undertake is not only impossible to achieve, but would fail to remedy many of HM 5.3's most vexing problems.

Equally troublesome, HM 5.3's faulty strand distance multiplier causes it to produce loop lengths in excess of its intended limit of 18,000 feet,[348/] with some clusters containing loops as

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344/ Exh. No. 501T 75:14-18, (Tardiff). The converse is also true. When the strand distance multiplier calls for more cable than HM 5.3 calculates, the clusters expand and potentially overlap with adjoining clusters. Exh. No. 501T 75:18-20, (Tardiff). *See also* Tr. 1445:4-1448:4, (Dippon).

345/ Exh. No. 501T 76:3-16, (Tardiff).

346/ Exh. No. 1056T 21:14-22:17, (Spinks).

347/ Exh. No. 601T 27-30 (Dippon).

348/ Exh. No. 601T 71-72 (Dippon); Supplemental Reply Testimony of Francis J. Murphy on behalf of Verizon Northwest Inc. (June 18, 2004) at 2-3 ("Murphy Supp. Reply"); Exh. No. 501T 78:9-12, (Tardiff) ("In short, the expansion and compression induced by the strand distance adjustment seriously distort not only the outputs of the Model, but also the engineering rules the Model was intended to represent.").

long as 38,000 feet.[349/] This modeling flaw was in no way remedied by AT&T's recent submission of a revised version of HM 5.3,[350/] as clearly the strand-distance multiplier is not operating as intended.[351/]

3. HM 5.3's Cluster Input Database Produces Anomalous Results.

Despite Verizon NW's lack of access to critical aspects of the TNS preprocessing (including the clustering source code), Mr. Dippon was able to test various portions of the *output* of this process and uncovered a series of flaws in HM 5.3's cluster input database. Among these errors were the following:

- The clustering algorithm generates clusters in a randomized fashion that bear no resemblance to real-world customer groupings.[352/]
- By placing the SAI halfway between the two farthest points in a cluster, HM 5.3 incorrectly models SAIs in areas far removed from customers, outside wire center boundaries, in rivers, on top of freeways, and in the middle of downtown areas — none of which are locations where an engineer would place an SAI.[353/]
- By using the density of the "dominant CBG" for an entire cluster, rather than the actual density of a cluster, HM 5.3 distorts the density characteristics of its modeled clusters.[354/]
- HM 5.3 erroneously surrogates customer locations on roads where no customers are, or would be, located (e.g., limited access highways, ramps, service roads and driveways).[355/]

[349/] Exh. No. 601T 72, (Dippon).

[350/] Murphy Supp. Reply at 2-4; Dippon Supp. Reply at 10-11.

[351/] Exh. No. 601T 73 (Dippon). Notably, both Dr. Mercer and Mr. Fassett admitted that they never conducted any analysis whatsoever to verify that HM 5.3 was in fact limiting its loop lengths to 18,000 feet. Tr. 1528:20-1530:2 (Fassett) (also stating that they never analyzed Mr. Murphy's workpapers establishing the fact that HM 5.3 models a significant number of clusters that exceed 18,000 feet).

[352/] *See e.g.*, Exh. No. 601T 81-83, (Dippon).

[353/] Exh. No. 601T 75-76 (Dippon). *See also* Exh. No. 451T 3:11-5:16, (Richter).

[354/] Exh. No. 551TC 30, n.46, (Murphy).

[355/] Exh. No. 601T 87, (Dippon).

- Approximately 2,533 customers are geocoded at zero latitude, zero longitude (i.e., on the equator).[356/]

- While there exist many more examples, HM 5.3's models a cluster that contains only one household in a 50+ unit building.[357/]

4. HM 5.3's Feeder Plant Design Violates Standard Network Design Principles.

HM 5.3's method of modeling feeder plant suffers from the same disregard for widely-accepted engineering assumptions. As a result, the feeder network modeled by HM 5.3 bears no resemblance to an actual fully-functioning network. For example, the Model allows for the underground installation of controlled environmental vaults ("CEVs"), but only in clusters with a specified number of lines.[358/] Rather than base its decision to place RTs underground on local conditions (e.g., city ordinances), AT&T's sole determinant of an RT's underground placement is the size of the cluster — an RT is only placed underground in a CEV when a cluster requires more than 2,100 lines of capacity.[359/] The size of the clusters was also increased from earlier versions of the Model to allow for larger clusters that were able to accommodate larger RTs.[360/] As such, because HM 5.3 places RTs in underground facilities only when demand exceeds the 2,100-line threshold, the high costs of acquiring and installing underground structures are spread over a large number of lines, thereby artificially, and unrealistically, reducing the cost per line of

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356/ Exh. No. 601T 87-88, (Dippon).

357/ *Id.* at 78-79, (Dippon).

358/ Exh. No. 501T 31:6-9, (Tardiff).

359/ *Id.*

360/ *Id.* at 31:9-11, (Tardiff); Exh. No. 551TC 44:10-45:3, (Murphy) (noting that AT&T increased the maximum cluster size from 1,800 lines to 6,451 lines, and completely ignored the DA-sizing criteria).

the equipment.[361/] This stands in sharp contrast to the real world, where the placement of such structures is dictated by factors not related to the number of lines (such as zoning regulations). Consequently, there is no guarantee that the high fixed costs of underground structures can be averaged over a large number of lines.[362/] HM 5.3's novel theory that "bigger is better" should be contrasted with VzLoop's approach, which relies upon proven practices actually employed in designing a real-world network.[363/] As a result, VzLoop models more than twice the number of RTs (which is consistent with the design of a network with smaller DAs), most of which are about one-third the size of those produced by HM 5.3.[364/]

5. HM 5.3 Models Significantly Understated Amounts of Feeder Plant.

HM 5.3 builds incredibly overloaded distribution routes, thereby shifting a significant portion of the costs associated with building what should be the more costly (per foot) underground feeder plant into the distribution category.[365/] This failure to properly to categorize and cost the feeder and distribution segments of the loop can be attributed to a number of causes, the most significant of which is HM 5.3's modeling of 6.8 million feet of loop fiber feeder cable (nearly one-third of the total feeder distance) and its associated structure using its *distribution* plant mix, sharing and cost inputs (e.g., sharing inputs, use of block cable with no structure, and pole spacing assumptions specific to distribution plant).[366/] In addition, as also noted above, HM

361/ Exh. No. 501T 31:11-15, (Tardiff).

362/ *Id.* at 31:15-17, (Tardiff).

363/ *Id.* at 32:10-13, (Tardiff); Tr. 1229:25-1232:23 (Tucek/Richter)

364/ Exh. No. 501T 32:5-6, (Tardiff).

365/ Tr. 1377:19-1379:16, 1392:9-21 (Murphy).

366/ Tr. 1378:14-1379:16 (Murphy); Exh. No. 551TC 60:8-14, (Murphy); *see also* Exh. No. 702 14 (HM 5.3 Model Description).

5.3 models excessively large clusters, which serve to reduce the amount of feeder route distances, while simultaneously overloading the distribution routes.[367/]

HM 5.3 also systematically fails to recognize that, in dense urban areas, office parks, industrial parks, and campus environments — where the majority of AT&T's customers are located — the most efficient, least cost loop design is to build all-feeder loops to the customer premises, and to terminate these all-feeder loops in an indoor SAI in the basement of each building.[368/] HM 5.3, however, models a single outdoor SAI and lower cost distribution cable and structure extending from that SAI to each building.[369/] As such, the UNE loop costs are significantly understated because HM 5.3 replaces the more expensive all-feeder loops reaching all the way to the customer premises with lower cost distribution facilities, thereby denying Verizon NW full recovery of the costs incurred in making these all-feeder loop-elements available.[370/] Other contributing factors include: (1) HM 5.3's significantly overstated fiber feeder strands (which over-allocate feeder structure to high-capacity services allegedly not at issue in this proceeding), (2) HM 5.3's misallocation of DLC common equipment costs (thereby

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[367/] Tr. 1378:14-1379:16, 1429:13-17 (Murphy) ("the excessively large clusters are having a direct impact on the length of the feeder cables. Were they shorter, obviously you would need to get out into those distribution areas with a little bit more feeder going out that way.")

[368/] Tr. 1378:14-1379:16 (Murphy); Exh. No. 551TC 63:17-66:9, 71:1-11, (Murphy) (explaining that the only distribution plant in these downtown areas is the building (or riser) cable, which is generally privately-owned and maintained by the building owners, not the ILEC). *See also* Exh. No. 551TC 73:1-12, (Murphy) (recognizing that AT&T's own witnesses have acknowledged that, in downtown areas, business districts, and other densely populated areas, the forward-looking, least-cost would be to model underground feeder cable that terminates in an SAI in the basement of each building).

[369/] Exh. No. 551TC 63:17-66:9, (Murphy).

[370/] *Id.* at 64:6-13, 75:3-76:2, (Murphy).

causing POTS services to subsidize DS-1s along the modeled feeder routes), and (3) HM 5.3's excessively long copper loops (which minimize feeder lengths).[371/]

C. Switching Model Issues

HM 5.3's end-office switching cost estimates are uneconomically low for a number of reasons. First, contrary to the purchasing patterns of actual carriers, which buy a mix of equipment purchased at high, new equipment discounts and other equipment purchased at less generous growth discounts, HM 5.3 incorporates the FCC's switching cost inputs, which assume that all equipment is purchased new.[372/] This error clearly produces costs that are too low.[373/] Further, the switching inputs are based on old data that is not representative of current switches.[374/] Particular costs that are improperly excluded as a result include: (1) costs associated with capabilities such as ISDN, SS7, and CLASS[375/] and (2) costs for OC-3/DS-1 ADM ("add-drop multiplexing") equipment, which are necessary to enable the switches modeled by HM 5.3 to interface with the interoffice facilities ("IOF").[376/] Finally, contrary to the findings

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371/ Tr. 1378:14-1379:16 (Murphy). These modeling flaws are compounded by HM 5.3's unrealistic structure mix assumption of 50% aerial, 15% buried, and 35% underground *distribution* cable and structure in the core areas, rather than the nearly 100% underground feeder cable and structure mix that would be expected. Exh. No. 551TC at 76. Structure mix inputs are described below.

372/ Exh. No. 501T 84:8-85:9, (Tardiff). The FCC has repeatedly rejected the assumption (made by HM 5.3) that TELRIC studies be based on all new switches. *TELRIC NPRM*, ¶ 77.

373/ If carriers were to purchase all their switching equipment at a single point in time, the prices vendors charged for that new equipment would increase in order for vendors to remain economically viable. Exh. No. 501T 13:9-7, (Tardiff). And if all equipment were purchased at a single point in time, other inputs (e.g., switching fill factors) would have to be adjusted (and costs would necessarily increase) to account for this fact. *Id.* at 85:8-87:9, (Tardiff).

374/ Exh. No. 551TC 133:12-134:9, (Murphy).

375/ *Id.* at 551TC 134:1-9, (Murphy).

376/ *Id.* at 135:22-137:6, (Murphy)

of the FCC, HM 5.3 incorrectly reduces (by 13 percent)[377/] the already low switching costs by invoking a $30 per line "analog line offset."[378/]

D. Other Model Issues

1. HM 5.3's Modeling of an All-Fiber Network Is Fundamentally Flawed and Inappropriately Removes Investments and Costs from UNE Calculations.

The all-fiber network that HM 5.3 attempts to model exaggerates demand (and the subsequent cost reductions associated with structure sharing), employs faulty network design parameters, and, as a result, produces a nonfunctional network and inappropriately reduced loop UNE cost estimates.[379/] For instance, HM 5.3 uses an input value of 2,869 high-capacity optical services, but only defines terminal equipment for a subset of 668 DS-3 services, thereby producing a network that would never work.[380/]

More importantly, the amounts of high-capacity optical services assumed by HM 5.3 are incredibly inflated (as compared to Verizon NW's actual numbers), and as a result, the Model over-assigns millions of dollars of investment to a fabricated high capacity fiber network, the majority of which (77%) the Model discards. HM 5.3 produces excessive amounts of distribution fiber routes and an even more outlandish overstatement of fiber strands in the feeder. For the 2,869 services HM 5.3 places on the all fiber network, it over-builds the distribution network using a requirement of 3,420 fiber strands and then builds an absurd feeder design with

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377/ Exh. No. 501T 87:11-15, (Tardiff).

378/ Exh. No. 551TC 134:17-135:21, (Murphy)

379/ *Id.* at 14:4-19, (Murphy).

380/ *Id.* at 101:5-6, (Murphy).

11,476 fiber strands. (A point-to-point fiber network (like the one being modeled by HM 5.3) should contain the same number of fibers in the feeder as in the distribution.).

HM 5.3 then uses these inflated amounts of high-capacity fiber requirements to reduce the structure investment assigned to POTS, private line DS-1 and DS-3 UNEs. HM 5.3 discards the vast majority of the costs attributed to the all-fiber network based on an erroneous assumption that certain UNEs included in HM 5.3's so-called "Hi-Cap" category are *not* being priced in the instant proceeding.[381/] Rather than use the actual number of OC-N services (i.e., 182 (or 6%) of the total 2,869) — the only fiber network services not at issue in this proceeding — the Model fabricates a number that is 77% of the total to justify eliminating 77% of the fiber network investment (instead of 6%). These errors ultimately lead to the inappropriate elimination of millions of dollars of investment.[382/] Specifically, after applying factors based solely on the unsubstantiated opinions of its consultants to structure sharing with other utilities, between feeder and distribution and feeder and IOF, an additional $7,868,396 of distribution structure investment[383/] and another $16,557,149 of feeder structure investment[384/] is removed to account for the high-capacity investment that is "not at issue in this proceeding."[385/] In the end, only $55.2 million in distribution structure investment (30 percent of the original distribution structure investment of $238 million)[386/] and $46 million in feeder structure investment (36

381/ *Id.* at 14:10-19, (Murphy).

382/ *Id.* at 14:18-19, (Murphy).

383/ Murphy Supp. Reply 33:6-10.

384/ *Id.* at 88:8-11.

385/ Exh. No. 551TC 33:4-8, (Murphy).

386/ Murphy Supp. Reply 32:13-14.

percent of the original feeder structure investment of $126,388,266) remains.[387/] Correcting for just the excess 8,056 fibers in the feeder versus the distribution results in an increase of over $10 million in total investment associated with the loop UNEs "at issue" in this proceeding. It also has a significant impact on the unit cost produced for DS-3 loops, which jump nearly 4.2 percent (to $698.93 per month) when corrected.[388/]

2. HM 5.3 does not build high-capacity fiber facilities directly to the customer premises.

Equally troubling is AT&T's claim that the high-capacity loops modeled by HM 5.3 are provisioned over fiber cables that extend all the way to the customer premises.[389/] This is simply not true. Although Verizon NW provided AT&T with detailed customer location data identifying the locations where specific types of high-capacity services terminate, and TNS geocoded and surrogated the locations of these "high-capacity" customers, AT&T ignored these data, and instead assumed (incorrectly) that all high-capacity services were located at the same locations as the POTS customers.[390/] In doing so, HM 5.3 ignores the many customer locations to which *only* fiber-based services are deployed, and relies upon an unrealistic degree of sharing between POTS and fiber-based customers. Moreover, by effectively guessing at where these high-capacity services are located, how many there are, the distance from the SAI, and what other services are on the same route, there is no way that AT&T can credibly claim that HM

387/ *Id.* at 88:11-14.

388/ *Id.* at 104:20-21.

389/ Exh. No. 855 (HM Model Description) 28-29.

390/ Exh. No. 551TC 98:1-2, (Murphy).

5.3's fiber cables extend all the way to the customer premises because AT&T does not even know how many of each type there are, let alone where they should be located.[391/]

3. HM 5.3 fails to include a wide variety of network requirements, or to treat them consistently.

In addition to the aforementioned flaws, HM 5.3 proposes unrealistically low UNE rates in part because it ignores many of the costs associated with a real-world network. It greatly understates, for example, the costs associated with operating the network once it is built.[392/] It lacks sufficient capacity to operate the modeled network efficiently.[393/] It ignores the demand placed on Verizon NW's network by CLECs, wireless carriers, other local telephone companies, and Internet service providers.[394/] And it fails to deal consistently with loop, switching, and IOF. For example, it assumes that feeder shares structure over 75% of the modeled IOF route distance, but then assumes pole spacings and structure sharing percentages that differ between feeder and IOF.[395/] Thus, it violates AT&T's own criterion that a model "deal with [these different network components] in a unified fashion."[396/]

For these and other reasons, HM 5.3 produces a wide variety of unrealistic and unreasonable results. It builds outside plant to only eight indoor SAIs, as contrasted to the 8,000 in Verizon NW's network.[397/] It omits the equipment necessary to connect to the wire center over

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391/ Exh. No. 551TC 15:16-16:7, (Murphy).

392/ Exh. No. 501T 11:11-12:6, (Tardiff).

393/ *Id.* at 3:16-17.

394/ Exh. No. 551TC 117:17-118:16, (Murphy).

395/ *Id.* at 90:3-10.

396/ Exh. No. 851T 6:8, (Mercer).

397/ Exh. No. 551TC 37:10-12, (Murphy); Tr. 1462:2-9 (Murphy).

2,200 of the fiber loops modeled for the provision of high-capacity services (including the DS-1s inappropriately excluded as high-capacity services).[398/] It designs 4,300 distribution fiber strands for these services, yet calculates a need for over 12,000 such strands in the feeder network.[399/] It incorrectly calculates 6.8 million route feet of feeder as though it were distribution.[400/] It designs only about 48,000 switched trunks for IXCs, and ignores completely the demand by other carriers for such trunks, thus modeling **[BEGIN VERIZON NW PROPRIETARY] [END VERIZON NW PROPRIETARY]** fewer switched trunks than the number actually ordered.[401/] And even with greater use of aerial structure than is warranted, HM 5.3 provides only about 27% of the pole investment required to replace Verizon NW's current poles at current prices.[402/] In short, HM 5.3 is fundamentally incapable of estimating the forward-looking costs of operating a fully functioning, integrated telephone network.

VIII. MODEL INPUTS

A. Loops

1. Plant Mix

The parties agree that the mix reflected in Verizon NW's current service area is an appropriate measure for the structure mix in the forward-looking network required to be modeled under TELRIC principles.[403/] That mix reflects the limitations that any network planner would face in designing a network today for Verizon NW's service area — including soil

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398/ Exh. No. 551TC 37:14-17, (Murphy).

399/ *Id.* at 37:19-21.

400/ *Id.* at 37:27-29.

401/ *Id.* at 37:33-38:3

402/ Tardiff Supp. Reply 50:10-13.

403/ Exh. No. 951T 13:9-22:3, (Fassett) (citing ARMIS data about existing plant mix percentages).

characteristics, rights-of-way limitations, congestion, and natural barriers. It also serves to understate UNE costs, because a forward-looking network would have to accommodate what both parties recognize to be increasing municipal pressure for installing more expensive underground facilities — for aesthetic, safety, and maintenance reasons.[404/] The Commission has previously agreed that "reflect[ing] actual [structure] mix" is appropriate.[405/]

VzLoop generally relies on comprehensive outside plant records to determine the structure type (aerial, buried, or underground) for every single route segment, which is reflected in the network table.[406/] For distribution plant, the average segment in these records is only 315 feet; for feeder, only 2,840 feet.[407/] VzLoop then makes certain adjustments to this data, but only where the number of required aerial or buried cables in the modeled network exceeds the maximum number for the existing structure type (*e.g.,* because of sag limits on poles, or the need to use conduit where multiple cables are placed below the surface).[408/]

In contrast, HM 5.3 employs a series of assumptions about structure mix that are designed to fit the round peg of ARMIS data into the square hole of HM 5.3's arbitrarily established "density zones." [409/] For example, in many wire centers where AT&T asserts that Verizon NW's costs for underground distribution would be zero, Verizon NW's own plant

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404/ Exh. No. 201TC 49:22-50:2, (Verizon Panel Direct); Exh. No. 226T 21-27, (Verizon Panel Suppl.).

405/ *Thirty-Second Supplemental Order*, ¶ 358.

406/ Exh. No. 201TC 49:10-11, (Verizon Panel Direct).

407/ Tr. 1335:15-17, (Tucek).

408/ Exh. No. 201TC 49:12-50:2, (Verizon Panel Direct); *see also* Tr. 1281:11-1283:10 (Tucek). The methodology for determining the structure type on each route segment is explained in greater detail in the VzLoop Cost Manual. *See* Exh. No. 226T, Attachment B, at 15-16.

409/ Exh. No. 951T 13:9-22:3 (Fassett); Exh. No. 851T, RAM-5 (HM 5.3 Inputs Portfolio) at 51, 59.

records indicate that underground actually constitutes 15-30 percent of existing structure.[410/] This mismatch is not surprising. As Mr. Richter explained, ARMIS data is simply an aggregation of all of the cable in the existing network by construction type that does not differentiate between feeder and distribution, does not separately identify IOF facilities, and provides no geographic references that correspond to the density zones employed by HM 5.3.[411/] For all these allocations, AT&T simply relies upon the undocumented and unspecified "experience" of its initial engineering witness, Mr. Donovan, which has been consistently rejected as a basis for setting UNE rates.[412/]

This arbitrary approach to cost modeling produces a plant mix that ignores natural and man-made barriers, disregards widely-accepted engineering standards, and ignores the need to accurately estimate the number and size of cables on a route or the number of other users that will share the same structure.[413/] For example, HM 5.3 ignores the fact that, despite being more expensive,[414/] underground cable is often preferable because it provides for "out-of-sight" plant, ensures better protection from the elements, and is easier to augment, repair and replace.[415/] Similarly, it does not always assume buried or underground construction when modeling cables larger than 2,700-3,000 pairs, and thus ignores completely the fact that cables of that size would

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410/ Exh. No. 451T 19:9-12 & n.18, (Richter).

411/ Exh. No. 451T 18:11-17, (Richter).

412/ *See, e.g., SBC California Proposed Decision* at 186, 191.

413/ Exh. No. 551TC 20:12-17, (Murphy).

414/ The costs associated with underground facilities include costs for excavation, restoration, and structure, such as conduits and manholes. Exh. No. 551TC 33:10-14, (Murphy).

415/ Exh. No. 451T 20:15-17, (Richter).

never be placed on poles.[416/] Indeed, AT&T's outside plant witness, Mr. Fassett, admitted that "you're not going to put 4,200 cables on aerial pole structure."[417/] Nevertheless, as Dr. Tardiff noted, in the Richmond Beach wire center alone, four of the five clusters have 4,200-pair aerial cable.[418/]

2. Structure Sharing

As noted above, there is no basis for Staff's view that input assumptions were established once and for all future proceedings in the *Eighth Supplemental Order*.[419/] That is particularly true with respect to structure sharing. First, in that order the Commission was addressing a record in which GTE had not provided the kind of actual and reliable evidence that Verizon NW has adduced in this proceeding to support the sharing percentages it has proposed.[420/] Second, the sharing inputs that the Commission essentially adopted by default were derived from Staff's recommendations that Staff has now conceded were not based on empirical data or any studies of any kind.[421/]

Similarly, AT&T's extreme sharing assumptions bear no resemblance to the real world and thus should be rejected. Just as Mr. Donovan acknowledged in a prior Commission

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[416/] Exh. No. 551TC 20:17-21:7, (Murphy) (recognizing other instances in which HM 5.3 fails to recognize the operating realities in Verizon NW's Washington serving area, including placing more aerial cables than a pole line could realistically support, accounting for multiple sheaths in a buried trench, and increasing the size of trenches and conduit to accommodate unrealistic levels of structure sharing). *See also* Tr. 1430:6-1431:18, (Murphy).

[417/] Tr. 1594:15-16, (Fassett).

[418/] Tr. 1460:10-13, (Tardiff).

[419/] Tr. 1011:13-1012:15, (Spinks).

[420/] *See Eighth Supplemental Order*, ¶ 64. As the Commission also pointed out, GTE "d[id] not provide the user with the flexibility to alter" its sharing assumptions. *Eighth Supplemental Order*, ¶ 68. Here, in contrast, Verizon NW's proposed sharing inputs may be changed by the user, by modifying VzLoop's OPTIONS table. Exh. No. 228TC 64:10-12 (Verizon Panel Rebuttal); *see also* Exh. No. 226T, Attachment B at 50-58 (Verizon Panel Suppl.). Mr. Spinks conceded this point on cross-examination. Tr. 1011:13-1012:15, (Spinks).

[421/] Tr. 1099:14-1100:17, (Spinks).

proceeding that his structure sharing proposals there amounted to "scorched everybody[,] not just scorched telephone,"[422/] so too are they here.

Aerial Sharing. VzLoop relies on the percentages of foreign and shared poles in its existing network, because these data reflect its experience about the actual extent of pole-sharing opportunities with other utilities in the areas that Verizon NW serves.[423/] This real-world data about the degree of sharing that actually occurs is far more reliable than the pure guesswork of AT&T's initial engineering witness, which is not Washington-specific, and is identical to his speculation in other states.[424/] As Mr. Richter notes, the suggestion that Verizon NW will be able to share away at least 50 percent of the cost of *the poles in its network,* and in some areas up to 75 percent of those costs, is simply blind to reality.[425/] The instances in which two other companies are located on the poles is quite rare.[426/] Even when cable companies or CLECs are on Verizon NW's poles, the costs of the poles are *not* borne equally by the parties, but rather (as Mr. Fassett admits) are borne almost exclusively by Verizon NW given the very low pole

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422/ Workshop, Docket Nos. UT-960369, -960370, -960371, at 188-89 (Feb. 14, 1997), *cited in* Alfred E. Kahn, Letting Go: Deregulating the Process of Deregulation 94-95 n.137 (1998).

423/ Exh. No. 201TC 50:11-51:4, (Verizon Panel Direct).

424/ Compare Exh. No. 951T 29, (Pole Spacing Chart) (Donovan) to Declaration of John C. Donovan, Cal. P.U.C. Docket No. R.93-03-003/I.93-04-002 (Verizon UNE Phase), at 44.

425/ HM 5.3 also inappropriately classifies approximately 30 percent of its aerial distribution cable as "block cable" and/or riser cable — in effect assuming that a substantial portion of Verizon NW's outside plant in core (downtown) areas consists of aerial wires that are strung from one building to the next (like a clothes-line) with absolutely no structure to support it. Exh. No. 551TC 76:14-17, (Murphy). HM 5.3's modeling of riser cable is equally unrealistic. HM 5.3 assumes, incorrectly, that riser cable is provided by Verizon NW, Tr. 1423:1-2 (Murphy), despite the fact that AT&T's own witnesses acknowledge that riser distribution cable is provided by the building owner and not Verizon NW. *See also* Exh. 201TC 32:20-33:14, (Verizon Panel Direct).

426/ Exh. No. 451T 23:11-13, (Richter). VzLoop's actual sharing data do reflect the ability of Verizon NW to enter into joint pole agreements with utilities. But as Mr. Richter also notes, these are not by any means easy to enter into or to administer. Exh. No. 451T 31:6-11, (Richter). Nor are they available throughout Verizon NW's territory. Exh. No. 451T 24:14-17, (Richter). Indeed, Mr. Fassett has identified only one such joint use agreement, with a government-owned utility in Snohomish County. Exh. No. 956TC 17:8-9, (Fassett).

attachment rates of $3.60 per year.[427/] The flawed assumptions in HM 5.3 provide no basis for rejecting the actual experience of Verizon NW as reflected in its pole sharing analysis.

Underground Sharing. Verizon NW identified the actual percentage of shared conduit in its existing network for use as an input to VzLoop.[428/] Records of every segment of all 22.5 million duct feet of conduit in its Washington network show that less than 80,000 feet of underground structure (less than 1 percent) are shared with other utilities.[429/] In contrast, AT&T assumes that one-half to two-thirds of all underground structure for feeder routes, and up to two-third for distribution routes, will be shared.[430/] Once again, this assumption is neither supported by any actual data nor different from Mr. Donovan's speculations provided in other states.[431/] It is premised on the wholly unrealistic premise that service requirements, construction schedules, and business plans are perfectly coordinated among the Verizon NW and other utilities, and that road construction projects and other public works are so ubiquitous that they constantly offer opportunities for sharing. In the real world, such situations are simply nonexistent — no matter how efficiently a carrier operates.[432/] The Florida Commission has rejected the same sharing

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427/ Exh. No. 451T 23:1-3, (Richter); *see also* Exh. No. 551TC 80:18-82:8, (Murphy). Mr. Fassett conceded that "[i]n some instances this sharing is accomplished with the application of attachment fees." Exh. No. 956TC 16:1-2, (Fassett). *See also* Tr. 1590:14-1591:3 (Fassett); Exh. No. 551TC 83:18-84:13, (Murphy) (prior Donovan recommendation to account for attachment fees).

428/ Exh. No. 228TC 55:10-56:4, (Verizon Panel Rebuttal).

429/ *Id.* at 63:1-5, & Exh. No. 232C, (Underground Sharing). Because Verizon NW's cost studies originally miscounted the total number of duct feet of conduit in its network, they erroneously used a 9.22 percent underground sharing input. Exh. No. 201TC 56:4, (Verizon Panel Direct); Exh. No. 228TC 63:2-4, n.117, (Verizon Panel Rebuttal). Thus, the UNE rates proposed by Verizon NW actually understate its costs by overstating the extent of its underground sharing. Tr. 1366:21-1367:2 (Tucek).

430/ Exh. No. 951T 23, (Fassett).

431/ *Compare* Exh. No. 951T 23 *with* identical proposal in Declaration of John C. Donovan, Cal. P.U.C. Docket No. A.01-02-024 (SBC UNE Proceeding) at 19. *See also SBC California Proposed Decision* at 177 (finding that his identical proposals in that California proceeding were based on speculation).

432/ *See* Exh. No. 451T 24:18-25:16, 28-31, (Richter).

assumptions that Mr. Donovan uses in this proceeding in favor of an underground sharing value of only 0.07 percent, in light of the same difficulties of coordinating work, safety considerations, and the lack of available space.[433/]

Buried Sharing. Verizon NW's experience has been that opportunities to share its trenching costs with third parties in Washington are uncommon. As a result, VzLoop does not assume any sharing of buried placement costs.[434/] In contrast, AT&T proposes sharing away two-thirds of the cost of buried distribution plant, and 60 percent of the cost of buried feeder.[435/] As Mr. Murphy noted, "while AT&T[] assume[s] that buried facilities will be shared extensively with other users, the costs they model for buried installation and restoration are insufficient to accommodate the relatively large trenches that would be necessary to support such extensive amounts of sharing."[436/] Indeed, Mr. Fassett acknowledged that he was not aware of any project while he was at NYNEX that involved plowing 12 separate cables into a single trench, as HM 5.3 assumes.[437/]

Mr. Donovan presents no empirical data to support these aggressive sharing percentages, and he does not even purport to base them upon his own experience. Despite the incentives for Verizon NW engineers to identify such sharing opportunities, in practice such coordination is and will continue to be extraordinarily difficult, and often impossible. AT&T itself has recognized that for these reasons, its own opportunities for co-trenching are "slim" since "most

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433/ *Final Order On Rates For Unbundled Network Elements Provided By Verizon Florida*, Docket No. 990649B-TP (Fla. P.S.C. Nov. 15, 2002) at 22-23 ("*Florida 2002 Order*").

434/ Exh. No. 201TC 52:15-16, (Verizon Panel Direct).

435/ Exh. No. 951T 22:4-5, (Donovan).

436/ Exh. No. 551 79:16-20, (Murphy).

437/ Tr. 1658:21-24, (Fassett).

extend fiber when customers order it."[438/] As Mr. Richter notes, different utilities cannot share the costs of trenching unless they bury their cables at the same time, and in the same trench. With differing needs and budget cycles, such opportunities are extremely rare — even assuming that such utilities are serving customers in the same area.[439/] While some municipalities do have ordinances designed to provide coordination in new construction, these recognize the foregoing practical limitations and thus typically are limited to notification or reasonable efforts requirements.[440/] For these reasons, the Florida Commission rejected such extreme assumptions about buried sharing, and agreed that BellSouth's experience showed that "sharing the costs of buried structures is rare because of timing problems and because CATV and power lines are already in place."[441/]

Feeder-Distribution Sharing. In VzCost, all cables which share a structure are assigned structure costs, whether copper or fiber, distribution or feeder, on a route-by-route basis.[442/] Where copper feeder and copper distribution are in the same sheath, the structure investment for that sheath is assigned to feeder and distribution elements in proportion to the capacity requirements of each.[443/] For each such segment, VzCost models only investment for the

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438/ Exh. No. 551TC 85:20-21, (Murphy).

439/ Exh. No. 451T 25:5-11, (Richter); *see also* Tr. 1300:14-21 (Tucek). As Mr. Richter notes, the only exception to this coordination is in residential subdivisions, where both Verizon NW and the electric company are compelled to serve customers at the same time and the control over the trench lies with the developer. Exh. No. 451T 25:11-14, (Richter). Neither party sustains the costs, and thus such situations do not implicate sharing.

440/ Exh. No. 451T 27:5-8 & n.35, (Richter) (quoting Lacey and Pierce County ordinances).

441/ *Florida 2002 Order* at 40-41; *see also* Tr. 1301:9-25; 1302:1-3 (Tucek).

442/ *See* Exh. No. 226T, Attachment B, 15-16, (Verizon Panel Supp.).

443/ *Id.* at 16.

structure necessary to carry the cable that is there.[444/] In contrast, AT&T bases its sharing percentage (55 percent) not on any empirical evidence, but on its characterization of data in a Kansas study that it never made available in this proceeding.[445/]

AT&T's undocumented assertion is contrary to empirical data gathered by Verizon NW about the actual extent of feeder-distribution sharing in its Washington network, which no party has challenged. This sample of 251 cable sections involving 28 different wire centers, taken from a wide variety of density zones, showed that only 8.37 percent consisted of both feeder and distribution. Of those 147 sections containing feeder cable, only 14.29 percent included distribution cable as well.[446/] Since VzLoop takes feeder-distribution sharing into account on a segment-by-segment basis, it captures the information involved in such real world data. There is no basis for relying on unsupported speculation rather than Verizon NW's actual (and expected) feeder-distribution sharing.

Loop-IOF Sharing. As noted above, the *Local Competition Order* permits reasonable allocations of sharing between loop and IOF. Verizon NW reflects such sharing by placing 12 fibers for each DLC modeled in the local loop network, and then assigning only one-half of the total fiber investment (including the corresponding support structure) to the local loop network. The IOF fiber-facility costs, including the supporting structure, are based on the per fiber, per foot cost of the entire fiber network modeled by VzLoop. In this way, VzCost captures the economies of providing local loops, IOF transport, and high capacity loops using shared

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444/ *Id.*

445/ Exh. No. 951T 24:15-25:2, (Donovan); Exh. 451T 32:8-10 & n.46, (Richter).

446/ Exh. No. 451T 32:2-6, (Richter).

facilities.[447/] In contrast, HM 5.3 develops costs for the IOF network in a vacuum, disregarding completely the design of the loop network and using overly-simplistic assumptions that every IOF fiber cable contains 24 fibers, and that feeder and IOF facilities will share structure 75 percent of the time.[448/]

Effects of Competition on Third Party Sharing. At the hearings, the Commission asked both parties whether sharing with other utilities would be affected by the TELRIC requirement that cost studies should assume a competitive market. As both parties' engineering witnesses testified,[449/] Verizon NW already is subject to competitive pressure, and this pressure has not allowed it to overcome the hurdles to substantial sharing. The fully competitive market posited by TELRIC would not be likely to change that fact. First, as Dr. Shelanski noted, such a competitive market "does not necessarily mean . . . competition for every line," since "[c]ompetitors rationally stay out of certain markets."[450/] Rather, full competition in the sense that TELRIC defines it arises from any entrant or potential entrant "that puts pressure on the prices of the carrier."[451/] Such pressure is increasingly coming from intermodal competitors such as wireless companies that would not have any great need to share Verizon NW's wireline structure.[452/]

But as Mr. Richter observed, it is also hard to envision situations where the marketing

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447/ Exh. No. 201TC 56:11-22, (Verizon Panel Direct).

448/ Exh. No. 551TC 90:5-6, (Murphy).

449/ Tr. 1418:11-15 (Richter). Mr. Fassett stated that the marketplace in which ILECs operate today is a "competitive marketplace." See Exh. No. 956TC 6:18 (Fassett). *See also* Tr. 1578:4-5 (in which he speaks of the "competitiveness that's out there right now").

450/ Tr. 511:19-22 (Shelanski).

451/ Tr. 529:23-530:2 (Shelanski).

452/ Tr. 514:19-25 (Shelanski).

division of a new entrant would regularly provide its competitor with "clues as to where they might design their plant or may require plant."[453/] Extensive competition in the Alaska market, for example, has not led to greater sharing.[454/] In short, new facilities-based competitors in need of wireline structure would face the same insuperable obstacles that generally prevent utilities from sharing today. And, because they are competing with both the incumbent and with each other, they have even less incentive to engage in the information sharing that is a prerequisite to successful structure sharing.[455/] Indeed, the TELRIC framework has led the Florida Commission to conclude that the use of sharing percentages greater than those employed by Verizon NW here would lead to UNE pricing determinations that are "severed from reality,"[456/] because in that framework electric companies and cable operators are *not* rebuilding their networks from scratch, but already have their facilities in the ground.[457/]

3. Placement Costs

Verizon NW's placement inputs are based on the actual contract prices that its pays for the tasks required to construct a network, such as placing poles, digging trenches, or laying conduit.[458/] As Mr. Richter stated, these contracts cover a wide range of construction tasks and are "available for any type of work [one] need[s],"[459/] While there are some construction tasks

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[453/] Tr. 1418:14-15 (Richter).

[454/] Tr. 511:2-512:20 (Shelanski).

[455/] The Commission has also asked whether sharing in a competitive market must also take into account the need for a line count adjustment. To the extent Verizon NW's structure costs are spread over fewer lines, its per-line costs would obviously increase.

[456/] *Florida 2002 Order* at 42.

[457/] *See, e.g.*, *id.* at 41-42.

[458/] See Exh. No. 201TC 31:1-4, (Verizon Panel Direct).

[459/] Tr. 1273:16-21 (Richter).

that might fall outside the scope of these contracts, and therefore be bid to other contractors, there is no evidence on the record that the costs of such work would generally be cheaper than the SSP contracts used in Verizon NW's cost study, which are also competitively bid by Verizon.[460/]

To determine how much certain tasks have to be performed, Verizon NW relied wherever possible on recent data about the prevalence such tasks in cable placement (relying on expert judgment only for a few limited variables, such as the amount of pre-ripping[461/]). For example, to model the percentage of buried structure requiring hand-digging and boring, Verizon NW relied on Washington-specific data for what these percentages have been over the three years before the model was finalized.[462/] There has been no showing that these current percentages are not forward-looking — and no reason to use different percentages based only on guesswork.

By contrast, AT&T's placement tasks are based almost entirely on sheer speculation, national averages, or the kind of undocumented experience that has consistently been found unacceptable.[463/] The contractor surveys were conducted some years ago with unspecified contractors, have already been rejected by this Commission and the FCC,[464/] and have not even

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460/ Tr. 1278:24-1279:14 (Richter).

461/ *See* Exh. No. 201TC 51:15-52:11, (Verizon Panel Direct).

462/ Tr. 1287: 11-24. See Exh. No. 201TC, at CD No. 2/Cost Study Support/Options/02Waha&con.xls. The only challenge AT&T has presented to these percentages was the suggestion that they did not factor in subdivisions, where plowing might be more prevalent. Tr. 1228:2-23 (Tucek). However, as Mr. Tucek pointed out, sub-divisions — which are only at the end of distribution routes — represent only a very small percentage of Verizon's buried cable structure. Tr. 1289:20-1290:2 (Tucek).

463/ *See, e.g.,* Exh. No. 951T 43:7-53:2, (Donovan). Mr. Fassett asserted that AT&T's placement costs are supported by undisclosed contracts he had allegedly reviewed not in Washington. And he admitted that there were stark differences between his conclusions here and in Alaska. *See* Tr. 1549:6-15; 1551:23-1553:8; 1558:1-21; 1560:8-1562:14; 1565:10-1570:7, (Fassett).

464/ *Eighth Supplemental Order* ¶¶ 91-103 ("The Commission agrees with GTE that the method used by AT&T to collect data from vendors was flawed . . . . We find that the outside plant data collected from the vendors by the

been updated.[465/] AT&T's speculative claims about crew size and rates of work also strain credulity and are also flatly at odds with the real world requirements recounted by Mr. Richter. The recent draft SBC decision concluded that many of Mr. Donovan's proposals regarding placement rates in that case (which are almost identical to those he advanced here[466/]) should be rejected because they were based purely on his "opinion."[467/]

For example, with respect to copper cable labor costs, HM 5.3 labor cost reductions (from early HAI model cable inputs recommended by its engineering advisors) range from 90.7 percent (for a 400-pair cable) to 97.1 percent (for a 4,200-pair cable).[468/] As Dr. Tardiff testified, "Such large decreases in labor costs are simply implausible."[469/] Indeed, accepting HM 5.3's severely understated cable labor inputs would require one to believe that about 260 Verizon NW employees could engineer, splice and place on poles and in buried or underground facilities all the cable necessary to serve Verizon NW's customers throughout the state of Washington in one year.[470/]

Hatfield engineering team do not provide sufficient validation for the opinion of these experts . . . . In summary, the Commission disagrees with the method used by the Hatfield team to collect data from outside plant contractors"). *See also Tenth Report and Order,* ¶¶ 102, 113, 115, 165, 171, 172, 211, 270, 279, 281, 297, 327.

465/ Tr. 1563; 1567-68; 1648 (Fassett)

466/ *SBC California Proposed Decision* at 197-99.

467/ *Id.* at 191.

468/ Exh. No. 501T at 62: Table 8 (Tardiff).

469/ *Id.* 62:4.

470/ *Id.* 62:13-63:2.

4. Material Costs

Similarly, all of Verizon NW's material inputs reflect the prices that it has actually been able to negotiate with its vendors.[471/] Most such prices come from vendor contracts in effect at the time the filing was made.[472/] Where Verizon NW did not have a current contract price, it relied on its recent purchases.[473/]

By contrast, although provided with those actual prices in discovery, AT&T has once again relied for many of its proposed material prices on six-year old information, from other proceedings, in other jurisdictions — in some cases never disclosing the identity or details of these "quotes."[474/] AT&T was not sufficiently familiar with the details of such information to be certain whether its proposed costs for copper and fiber cable represented only material costs or installed costs.[475/] Nor has AT&T presented any rebuttal of Verizon NW's proposed material prices: the only specific critique that AT&T offered concerned the decision to use 24-gauge as opposed to 26-gauge cable,[476/] addressed below. AT&T's purported restatement of Verizon NW's costs simply selectively uses such contract prices only when they are lower than HM 5.3's prices.[477/]

471/ See Exh. No. 201TC 30:14, (Verizon Panel Direct).

472/ *Id.* 30:15-16.

473/ *Id.* 30:16-18.

474/ Exh. No. 401TC 3:14-23 (Tucek). For example, despite the fact that Verizon NW provided a material cost for a 40-foot Class 4 pole of **[BEGIN VERIZON NW CONFIDENTIAL] [END VERIZON NW CONFIDENTIAL]** See Ex. 201TC, CD No. 2, AT&T continued to rely on the years-old HAI default value of **[BEGIN VERIZON NW CONFIDENTIAL] [END VERIZON NW CONFIDENTIAL]**. *See* Exh. No. 856 at 25.

475/ Exh. No. 401TC 3:19-22, (Tucek).

476/ Exh. 751TC 23:4, (Turner).

477/ Exh. 228TC 54:16-55:3, (Verizon Panel Rebuttal).

As noted above, the Commission's prior orders have clearly directed parties to root their inputs in objective data wherever possible. Verizon NW has done so, by using extensive real world data as a basis for its material as well as placement costs. By contrast, AT&T has continued to rely heavily on its expert's unsupported assertions while entirely ignoring the real world information that Verizon NW has provided to AT&T and all other parties.

5. Fill Factors

Distribution and Feeder Cable Sizing. VzLoop and HM 5.3 both use sizing factors — rather than fill factors — to determine how much distribution and copper feeder cable to model in a forward-looking network. Such a method makes sense. As Verizon NW pointed out in its testimony,[478/] fill factors may vary considerably from one point in the network to another, and from one time to another. Engineers thus use sizing factors to assure that feeder and distribution cable is sized appropriately to meet customer needs as well as reasonably foreseeable demand.

With respect to copper feeder cable, the parties essentially are in agreement. Verizon NW uses a feeder cable sizing factor of 1.2.[479/] By comparison, AT&T divides current demand by 0.80,[480/] which is the same as multiplying by 1.25. Thus, other things being equal, HM 5.3 will model slightly larger copper feeder cables than does VzLoop.

There is, however, disagreement on the appropriate sizing factor for distribution cable. Verizon NW uses a 2.16 sizing factor, which is based on an assumption of 2.5 pairs per customer location (the midpoint of Verizon's engineering guidelines for residential customers). HM 5.3

[478/] Tr. 1253:11-1254:4 (Tucek).

[479/] Exh. 201TC 40:1-3, (Verizon Panel Direct).

[480/] Exh. No. 856 at 63.

divides by 0.75,[481] which is the same as multiplying 1.33. This value is consistent with an assumption of 1.52 pairs per customer location, and is at the very low end of Mr. Donovan's recommended range.[482] Even this estimate, however, is inconsistent with the testimony of other AT&T witnesses. In Florida, Mr. Riolo testified that two pairs per dwelling unit "was something of a minimal guideline" and that in very affluent areas that "five and six pair would be the proper number per household"[483] Indeed, in the first Washington cost proceeding Mr. Fassett — who has adopted Mr. Donovan's direct testimony — testified that two pairs per customer location was the correct number.[484] Additionally, AT&T's Outside Plant Engineering Handbook, which AT&T has relied upon in its Inputs Portfolio and engineering testimony, recommends that engineers build 2 pairs per residence.[485] Verizon NW's 2.5 factor is a reasonable one, given the need for higher sizing factors for business locations.

In contrast, HM 5.3 excludes the very real and current costs of growth, customer churn, and fluctuations in demand,[486] in direct violation of the Commission's requirement that a cost model "make[] realistic assumptions about capacity utilization rates, spare capacity, field conditions, and fill factors."[487] As Verizon NW has explained, real-world engineering guidelines "are designed to cope with three undeniable facts: (1) demand grows over time; (2) demand is uncertain, both as to place and time (it cannot be determined in advance *which* customers will

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481/ *Id.* at 35.

482/ Exh. No. 951T 58:1-4, (Donovan).

483/ Exh. No. 451T 61:16-62:1, (Richter).

484/ Tr. 1308:21-1309:4 (Tucek).

485/ Exh. No. 862 at 3-11.

486/ Exh. No. 501T at 10:10-13:17, (Tardiff).

487/ *Eighth Supplemental Order*, ¶ 10.

move, when they will move, or how many lines they will want); and (3) technological change and changing market conditions require periodic upgrades to software and hardware."[488/]

DLC and Fiber Sizing. As explained in Verizon's VzLoop manual, the sizing of fiber cables in Verizon's model is based on the cumulative number of fibers needed on each route, and on the available discrete sizes of fiber cables. VzLoop models a fixed number of fibers per fiber-fed DLC, specified by a user adjustable variable. Verizon NW has set this variable at 12 fibers per DLC.[489/]

AT&T, by contrast, assumes that only four strands of fiber are necessary to serve existing demand. But AT&T can only support this input by illogically assuming that "protect" pairs — which are insurance against unexpected equipment failures — can also be used to provide other services. This is simply wrong. As Mr. Richter explained in his testimony, "service reliability is a critical feature of a modern data network and the level of risk in utilizing protect fibers in the same manner as spare fibers, would not be adequate to meet those demands."[490/]

6. DLC Assumptions

Apart from DLC sizing, which is discussed above, the parties have two principal disputes with respect to the costs of DLC facilities.[491/] The first involves the mix between integrated DLC

[488/] Exh. No. 501T 10:17-11:2, (Tardiff).

[489/] Exh. No. 201TC 42:6-9, (Verizon Panel Direct). As explained earlier, Verizon models 12 fibers per DLC in order to reflect economies of scope with the IOF network, but only assigns half of this investment to the local loop. This is consistent with the engineering requirement of six fibers per DLC for local service – two hot, two warm spare and two cold spare. *See* Ex. 265C (NPG-99-001 — Issue 3, Sept. 2001, 00625-OSP.pdf).

[490/] Exh. No. 451T 63:16-18, (Richter).

[491/] In addition, VzLoop and HM 5.3 make different assumptions about the location of DLCs in their respective modeled networks, principally (though not exclusively) because VzLoop employs a 12,000 foot copper loop length restriction, whereas HM 5.3 employs an 18,000 foot restriction. These model design differences are addressed at pages 57-58 *supra*.

("IDLC") and universal DLC ("UDLC") technologies. Verizon NW assumes that 90.2 percent of the loops served by DLC would use IDLC, with the remaining 9.8 percent using UDLC. [492/] AT&T assumes 100 percent use of IDLC, based on the assertion that multi-hosting is feasible in a multi-carrier environment.[493/] The second dispute involves the costs associated with installing DLCs. Verizon NW employs a markup of 46 percent over the material cost of the DLC to account for the costs of engineering, furnishing, and installing ("EF&I"). AT&T relies on a much smaller installation cost that is premised on the assumption that many of these tasks can be done "in the factory."[494/]

IDLC/UDLC Mix. Verizon NW's 9.8 percent UDLC reflects the need to provide UDLC lines for non-switched services and for stand-alone unbundled loops. It also reflects the FCC's requirement that under TELRIC a modeled network must employ "currently available" technologies, and not those that may become available in the future.[495/] As Mr. Murphy explained, it is not possible (and may never be possible) to unbundle individual loops in a multi-carrier environment.[496/]

Contrary to AT&T's testimony, the multi-hosting capabilities of GR-303 allow interface groups from one DLC system to connect to more than one switch, but only if those switches belong to the same carrier.[497/] The problem with employing IDLC today for delivery of a stand-

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[492/] Exh. No. 201TC 46:9-10, (Verizon Panel Direct).

[493/] Exh. No. 951T 64, 1:2 (Donovan).

[494/] Exh. No. 951T 64:8-9, 69 (Common Control Bank Pricing Table), (Donovan).

[495/] *Local Competition Order,* ¶¶ 683, 690; 47 C.F.R. § 51.505(b).

[496/] Exh. No. 551TC 46:11-47:4, (Murphy)

[497/] Exh. No. 451T 45:9-11 (Richter).

alone loop to a CLEC switch is that such a connection provides the CLEC with full access to the operations functionality (e.g., provisioning, alarm report, test access, etc.) of the DLC system and *all* of the lines served on that system by both Verizon NW and all other CLEC competitors. Such access creates significant risks of conflict between instructions sent by the different carriers' switches to the DLC system and of compromising the security and functioning of any of these competitors' services.[498/]

These unresolved technical issues are documented by DLC vendors such as Alcatel,[499/] as well as by Telcordia's *Notes on the Network*, upon which AT&T purports to rely. Telcordia also confirms that IDLC unbundling using separate "interface groups" for CLECs presents "a variety of issues (provisioning, alarm reporting, sharing of test resources, etc.) that are currently being addressed by the industry."[500/] And Telcordia continues to make clear on its web site that these issues have yet to be resolved.[501/]

Other Commissions have agreed.[502/] Most recently, in the recent SBC proceedings in California, Mr. Donovan "admitted that he does not know of a stand-alone loop provisioned over IDLC by any carrier in the entire country," and the ALJ found that "[t]he evidence shows that no carriers today provide unbundled loops over IDLC, due apparently to operational issues that

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498/ Exh. No. 451T 45:17-21, (Richter); *see also* Exh. No. 201TC 26:4-28:12, (Verizon Panel Direct).

499/ Exh. No. 451T 46:1-9, (Richter); Exh. No. 767; Exh. No. 865.

500/ Exh. No. 451T 46:5-8, (Richter); Exh. No. 767 at 12-55. Indeed, Mr. Donovan's own documentation recognizes as much. Exh. No. 955 at 12-55.

501/ Exh. 459 at 2.

502/ *Georgia/Louisiana § 271 Order*, ¶ 50; *Florida 2002 Order* at 129; *Order No. 23,738* (N.H. P.U.C. July 6, 2001) at 66.

remain unresolved."[503] The FCC's *Triennial Review Order* similarly recognized that, in requiring incumbent LECs to provide access to a transmission path over hybrid loops served by IDLC systems, "in most cases this will be either through a spare copper facility or through the availability of Universal DLC systems."[504]

DLC Installation Costs. Based again upon Mr. Donovan's undocumented experience,[505] AT&T proposes installation costs for DLCs based on very short time frames. As Mr. Richter explains, these guesstimates are wholly unreliable. At the outset, they ignore all of the site selection and acquisition requirements that an engineer must address — tasks which are especially time consuming in the case of DLC equipment given the need for housings, AC power, generator capacity, sophisticated grounding schemes, additional inspections and permits, and the need for a boom or crane.[506] They also grossly underestimate site preparation work, and they wrongly assume that all of the installation work is done "at the factory."[507] Finally, Mr. Donovan's estimates ignore the extensive testing process that is required following installation.[508]

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[503] *Proposed SBC Decision* at 144-45 (adopting 25 percent UDLC assumption). Here, Mr. Fassett asserted that he is aware of instances of multi-hosting in Alaska via IDLC. But he provided no details or documentation of such multi-hosting capacities and, conceded in discovery that this did not involve provision of lines to multiple CLECs. Exh. No. 892 (AT&T Response to DR 11-7).

[504] *Triennial Review Order*, ¶ 297. The D.C. Circuit's recent order upheld this determination against AT&T's protests about reliance on UDLC for these purposes. *USTA v. FCC*, 359 F.3d 554, 582-83 (D.C. Cir. 2004). The FCC's point about relying on UDLC to handle stand-alone loops was consistent with Verizon's testimony in the WCB's Virginia cost arbitration, which the WCB misconstrued to be some sort of waiver of the issue. *See* Exh. No. 228TC 61:12-62:11, (Verizon Panel Rebuttal); Exh. No. 1161 (Response to Bench Request No. 11) (attaching testimony). *See also* Application for Review at 21-27.

[505] Exh. No. 551TC 52:20-53:8, n.88, (Murphy).

[506] Exh. No. 451T 49:17-50:21, (Richter).

[507] *Id.* at 51:1-52:6.

[508] *Id.* at 52:8-23.

In contrast to these unreliable estimates, Verizon NW has employed an EF&I factor for DLC installation that is based upon real world experience.[509/] The costs of an individual DLC installation can vary markedly based on environmental conditions and terrain.[510/] Thus, to calculate an EF&I factor for its studies, Verizon NW uses data from the digital circuit equipment account (which includes DLC equipment) from a two-year period and across the entire Verizon nationwide footprint, in order to reduce any anomalies that might occur with respect to a DLC installation at a particular time or in a particular location.[511/] This average factor approach ensures that CLECs pay a price that reflects a fair measure of the cost generally involved in a DLC installation.[512/]

As the Illinois Commission recently concluded, "use of an average based installation cost methodology is appropriate for the purposes of setting UNE loop prices."[513/] Moreover, in this case the methodology has been corroborated by Verizon NW's survey of the five most recent Alcatel DLC installation workorders provided to AT&T in discovery. These showed that the average engineer, furnish, and install costs associated with those installations would yield a *higher* EF&I factor (52 percent) than the one Verizon NW uses in its studies.[514/] The Illinois Commission has considered and rejected AT&T's criticisms of these "linear loading factors," which Verizon NW has demonstrated are based upon wholly unsupported assumptions about the

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509/ Exh. No. 201TC 133:15-134:15, (Verizon Panel Direct).

510/ Exh. No. 228TC 125:3-8, (Verizon Panel Rebuttal).

511/ *Id.* at 124:20-22.

512/ *Id.* at 126:6-13.

513/ *See SBC Illinois Decision* at 96.

514/ Exh. No. 228TC 132:1-6, (Verizon Panel Rebuttal).

possibility of future changes in EF&I practices, and efforts to exclude some kinds of installations from the averaging methodology in order to reduce the average.[515/]

7. Other inputs

a) Cable Sizes

VzLoop sizes cable according to accumulated demand,[516/] and then applies the sizing factors discussed above. As Mr. Tucek pointed out during the hearing, this may well lead Verizon to underestimate it costs: for example, Verizon NW might assume the use of a single 400-where an engineer would actually use two different of cables (for example, a 300- and 100-pair cable) placed on two different occasions as demand increases over time. However, given the limits of the modeling process, Verizon NW has to assume — for purposes of cable sizing — that the network materialized instantaneously to serve all existing demand at once.[517/]

AT&T's method of determining cable sizes is similar, but as noted above it uses a different distribution cable sizing factor. However, as noted above, AT&T's sizing of cable does not correspond to the structure it assumes will support it: AT&T assumes the use of 4200 pair cable on poles that cannot possibly support such cable, despite a statement by AT&T's Outside Plant expert that "your're not going to put 4,200 cables on aerial pole structure. You're just not going to do that."[518/]

515/ *See id.* at 132:13-133:9 (Verizon Panel Rebuttal).

516/ Tr. 1342:20-1343:4 (Tucek).

517/ Tr. 1342:20-1344:6 (Tucek).

518/ Tr. 1594:15-17 (Fassett).

b) Cost of Obtaining Rights-of-Way

Although Verizon NW does sometimes pay for Rights-of-way, it does not explicitly model rights-of-way costs for most outside plant.[519/] The only such costs it does model are those for remote terminals, which are more likely to require transactions with private landowners. These right-of-way costs are reflected in the EF&I factor used by Verizon NW to model the placement costs of such equipment.

However, the value of existing rights-of-way is captured by VzCost in another way: by its use of real world data which generally assures that Verizon's modeled network falls on *existing* rights-of-way. As Mr. Richter explained in his testimony, an efficient forward-looking network would follow such existing rights-of-way wherever possible — because negotiating for new rights-of-way would not only be more costly than in the past, it would be more difficult where much of the available land has been developed.[520/] Unlike VzLoop, AT&T's model does not take any measure to capture the value of the existing rights-of-way. On the contrary, it dispenses entirely with existing routing and assumes network routes that are bear little relation to streets or other accessible and practical routes.

c) Air-to-route mile factor

Verizon NW applies a factor of 15 percent to both its feeder and distribution lengths to convert air miles to route miles in its modeled network when the air-mile distance is greater than 500 feet.[521/] This factor captures elevation changes and curves along feeder and distribution

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519/ Exh. No. 225 (5.Cost Study Support\Loop\Supporting Doc\material\Support\ \wa_vzmatlcstrCombinedrev7_2C.xls).

520/ See Exh. No. 451T 3:17-4:7, (Richter).

521/ Tr. 1323:16-1324:12 (Harris and Tucek).

routes, as well as the sagging of cables that occurs with aerial facilities.[522/] This factor is, if anything, extremely conservative: it is less than AT&T's proposed 27 percent adjustment,[523/] and reflects the fact that Verizon NW's distribution lengths are generally much shorter than those produced by HM 5.3.[524/] Thus, AT&T witness Mr. Mercer stated at the hearings that "if I were advising Verizon, I would probably say at a minimum you should use a bigger factor."[525/] This fact only further underscores the conservative nature of VzLoop's modeled cost estimates.

d) Gauge of Copper Plant

Verizon NW assumes universal use of 24-gauge cable.[526/] By contrast, AT&T assumes use of cheaper 26-gauge cable in most of the network, allowing for use of 24-gauge cable only for the smaller-sized cable (up to and including sizes of 200 pair).[527/] AT&T's attempt to make extensive use of cheaper 26-gauge cable is at odds with established engineering practice. The thinner 26-gauge cable is plagued by numerous maintenance problems,[528/] and engineers now try to avoid it wherever possible. It also is vulnerable to the environment everywhere it exists, and not just at the end of the cable runs. Engineers designing a forward-looking network would therefore try to make as much use as possible of 24-gauge cable, because it is more invulnerable to environmental damage.[529/] The extensive use of 26-gauge cable would also be at odds with the

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522/ Tr. 1324:19-21 (Tucek).

523/ Tr. 1597:4-13 (Mercer).

524/ Tr. 1325:23-1326:5 (Tucek).

525/ Tr. 1627:9-10.

526/ Exh. No. 228TC 55:11-14, (Verizon Panel Rebuttal).

527/ Exh. No. 751TC 23:7-10, (Turner).

528/ See Exh. No. 231C.

529/ Exh. No. 228TC 55:11-14, (Verizon Panel Rebuttal).

provision of advanced services, and would require reduction of the maximum copper loop length from 12,000 to 7,700 feet.[530/]

e) Drop Lengths

Verizon NW uses drop lengths that vary by wire center and structure type, ranging from 68 to 200 feet.[531/] These inputs, which are user-adjustable, are only slightly longer than those prescribed in the *Eighth Supplemental Order,* which ranged from 50 to 175 feet. AT&T proposes drops that vary by density zone, ranging from 50 to 150 feet.[532/] While AT&T cites to an average nationwide drop length study published by Telcordia in 2000, it makes no showing that this data is related to its drop lengths in this proceeding.[533/]

8. Geographic Deaveraging of Loops

The FCC's *Local Competition Order* found that a cost-based deaveraging plan that contains three zones is "presumptively sufficient to reflect geographic cost differences in setting rates for interconnection and unbundled elements."[534/] Verizon NW's deaveraging methodology reflects these principles, and produces density zones that, to the greatest extent possible, share common cost characteristics. It identifies a significant break in the wire center costs beginning with the LATAH wire center, and places that wire center and the 17 other wire centers with higher loop costs per line in density zone 3.[535/] Verizon NW then divides the remaining 81 wire centers in Washington into density zones 1 and 2 in a manner that minimizes the line-weighted

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530/ *Id.* at 56:3-5.

531/ Exh. No. 225 (5.Cost Study Support\Loop\Supporting Doc\master\LinesperSqMIBasedInputs.xls).

532/ Exh. No. 856 at 18.

533/ *Id.*

534/ *Local Competition Order,* ¶ 765.

535/ Exh. No. 226T at 12:2-8, (Verizon Panel Supp.).

root mean square error ("RMSE") measure of dispersion.[536] By using this method, Verizon NW has minimized the dispersion from the average, per-line cost in each density zone.[537] Staff witness Dr. Blackmon has expressly endorsed this RMSE measure, noting that it "produces an unbiased allocation of wire centers to zones, i.e., it does not give more weight to the accuracy of the low-cost wire centers than to the accuracy of the high-cost wire centers or vice versa."[538]

AT&T uses a line-weighted error measure based on the *relative absolute value* of the difference between wire center cost and zone price, rather than the *square* of the difference. This proposed approach produces a strong bias towards minimizing the dispersion in the lower cost zones, and as a result, leads to relatively fewer wire centers (and lower UNE rates) in these zones, while virtually ignoring the much higher disparity among costs in zones with the higher cost wire centers.[539] The effect of this approach, as Dr. Blackmon has noted, is to produce cost estimates that are statistically less efficient and to "skew[] prices downward across all zones without affecting the weighted average loop price."[540] As Verizon NW explained in rebuttal testimony,[541] the statistical inefficiency of AT&T's deaveraging methodology actually increases

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[536] *Id.* at 12:10-20.

[537] *Id.* at 13:8-9.

[538] Exh. No. 1101T 4:14-17, (Blackmon). Staff's methodology is somewhat different from Verizon NW's in that Verizon NW, unlike Staff, squares each error in calculating the deviation between the wire center costs and the average value for each density zone. *See* Exh. No. 226T 12:10-13:9 & n.7, (Verizon Panel Supp.); Exh. No. 401 6:14-18, (Tucek). This ensures that "large deviations between the zone average and the loop costs in a given wire center will be avoided if possible." Exh. No. 228TC 69:20-21, (Verizon Panel Rebuttal).

[539] Exh. No. 228TC 73:14-22, (Verizon Panel Rebuttal).

[540] Exh. No. 1101T 6:7-9, (Blackmon). Moreover, AT&T's proposed five-zone approach simply uses the existing tariffed zones assignments, thereby abandoning the basic methodology upon which its three-zone deaveraging proposal is based. As a result, under AT&T's five-zone proposal some wire centers assigned to given zones may have lower loop costs than wire centers assigned to lower-cost zones. Exh. No. 401TC 8:9-10, (Tucek).

[541] Exh. No. 228TC 67:6-68:14, (Verizon Panel Rebuttal).

the likelihood of economically inefficient rates in the lower cost zones where CLECs are most likely to compete.

The Commission should adopt Verizon NW's proposal (and that of AT&T) to establish no more than three rate zones. A three-zone rate structure is fairly straightforward, accounts for relevant cost differences, is easier to administer, and results in an adequate level of rate deaveraging.[542/] However, if the Commission opts for a five-zone proposal, Verizon NW has also proposed a five-zone rate structure using the RMSE methodology described above.[543/]

B. Switching

Verizon NW's proposed switching costs are forward-looking and, within the constraints of TELRIC, are the best estimate of the costs that Verizon NW would efficiently incur to provide the switching UNEs. Verizon NW's switching costs are based on the most recently available data and the extensive experience and expertise of Verizon NW's network engineers. AT&T's switching costs, on the other hand, are based on vintage switch investments, developed in 1998 for the FCC's universal service Synthesis Model.[544/] These data date back as far as 1983 and are incapable of provisioning today's technology.

1. Appropriate Rate Structure

The Commission should retain the traditional rate structure for unbundled switching, which consists of a combined flat, monthly per-port rate, and a minute-of-use ("MOU") rate. As

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[542/] Exh. No. 51TC 5:18-19, (Dye).

[543/] Exh. No. 226T 13:15-14:Rate Table, (Verizon Panel Rebuttal). The Commission should not apply a 1.50 multiplier advanced by Mr. Spinks to develop deaveraged rates for four-wire loops, as such a multiplier fails to capture the cost differences between two- and four-wire loops across zones and is unnecessary given the evidence Verizon NW has presented in this proceeding regarding its four-wire loop costs. Exh. No. 401TC 8:18-11:3, (Tucek). Nor should the Commission develop deaveraged loop rates for DS3 loops, since most of the cost of a DS3 loop can be traced to circuit equipment, which is not sensitive to changes in wire center geography. *Id.* at 12:7-15.

[544/] Exh. No. 551TC 125:18-19, (Murphy).

Verizon NW has demonstrated, significant portions of switching resources are traffic sensitive, and recovering those costs through MOU rates ensures they are recovered in the manner in which they are incurred based on each CLEC's proportionate amount of usage. By contrast, AT&T's proposal to instead adopt only a flat rate for switching violates the basic principle of cost causation and would create inefficient subsidies from low volume to high volume users.

a) A significant portion of switching resources are traffic sensitive.

As Verizon NW has demonstrated, a major portion of switching costs are traffic sensitive. Although AT&T claims that modern switches are limited only by the number of lines that they can serve, and not by processor or switch fabric capacity, this is incorrect. Indeed, as their witnesses acknowledged, even AT&T has traditionally advocated the traditional combined port/MOU rate structure for unbundled switching and recognized that some switching costs are traffic sensitive.[545/] In the Virginia WCB arbitration, for example, AT&T opposed a flat rate switching structure because it "d[id] not properly align rates and costs."[546/] Even AT&T's model in this proceeding has an input for "Switch Traffic Limit," defined as the "maximum amount of traffic . . . the switch can carry in the busy hour," contradicting AT&T's argument that switches are only port-limited.[547/]

[545/] *See* Tr. 1117:4-1119:8 (Chandler) (admitting that AT&T has previously endorsed models with up to 70 percent traffic sensitive switching costs). Not surprisingly, AT&T's decision to reverse its position on this issue coincided with the FCC's *ISP Remand Order*, which reduced the compensation paid to CLECs for ISP-bound traffic, thus eliminating AT&T's incentive to propose a rate structure that includes a per-MOU rate. *See* Tr. 1114:2-25 (Gillan).

[546/] *See* Direct Testimony of Robert J. Kirchberger on Behalf of AT&T in *Petition of WorldCom, 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 Expedited Arbitration*, CC Docket Nos. 00-218, 00-251, at 15 (filed July 31, 2001).

[547/] *See* Exh. No. 856 at 96.

When a new switch is planned, Verizon NW engineers carefully account for the estimated usage that they expect the switch to experience.[548/] Verizon NW described in detail the many parts of a switch that are traffic sensitive and have usage capacity limitations, including among others the switch periphery, switch fabric, and switch processor.[549/] AT&T did not refute this testimony and in fact appears to agree with Verizon NW on this point: its witnesses explained that carriers purchase different-sized switches according to specific demand of the location.[550/] Simply because estimates of usage are made *before* deployment does not demonstrate that that switching costs are not usage-sensitive and that Verizon NW does not incur additional costs based on increased usage. These costs are often incurred before deployment, based on the anticipated need for traffic sensitive switching resources. Although, in some cases, additional upgrades and capacity may be needed to account for higher than expected usage, it is always the goal of Verizon NW engineers to properly design switches ahead of time and monitor them while they are operational so that exhaust situations do not occur.[551/]

That switching costs are usage sensitive is supported by the fact that switch vendors have implemented tools in their switches to monitor capacity and identify and prevent potential exhaust situations. In the documentation for the 5ESS switch, for example, Lucent provides carriers with worksheets that permit them to perform detailed analysis of processor usage capacity to identify near-exhaust situations. In addition, Verizon NW uses an in-house tool that requires it to enter usage-related information, monitors the amount of traffic sensitive resources

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548/ *See* Exh. No. 301TC 6:13-15, (Verizon Panel Reply).

549/ *See id*. at 6-7.

550/ *See* Exh. No. 801TC 17 (Gillan/Chandler); Tr. 1122:1-1123:2 (Chandler) (agreeing that there are differences in switches with respect to processor size and communications module capacities).

551/ *See* Exh. No. 301TC 6:13-7:7, (Verizon Panel Reply).

on a switch, and determines when additional equipment is needed.[552/] If switches were not usage-limited, as AT&T claims, none of these extensive monitoring and planning procedures would be necessary. Indeed, despite these planning tools, Verizon NW has experienced situations of exhaust or near-exhaust of these traffic sensitive switch resources, providing more evidence that AT&T's claims that switches are not usage-limited are wrong.[553/]

b) A flat rate structure would violate cost causation and have adverse results.

In light of Verizon NW's demonstration that significant switching resources are traffic sensitive, the Commission clearly should retain the traditional combined port/MOU rate structure for unbundled switching. Existing TELRIC rules require that "incumbent LECs' rates for interconnection and unbundled elements must recover costs in a manner that reflects the way they are incurred."[554/] Because a flat-rate structure requires all users to pay the cost of an average customer's usage level regardless of their actual usage levels, such a rate structure would violate this principle of cost causation and create artificial and inefficient subsidies. As a result, carriers who have customers with higher-than-average usage would avoid paying their fair share of traffic-sensitive switching usage costs. At the same time, carriers with low-volume customers would pay for more than their fair share and effectively subsidize the high-volume customers. Because CLECs such as AT&T generally serve high-volume customers, the failure to allocate usage-sensitive costs to their high-volume customers would provide them an unfair subsidy and allow them to serve those customers without bearing the full costs of doing so.[555/]

552/ *See id.* at 6:11-9:10, (Verizon Panel Reply).

553/ *Id.* at 12:16-23.

554// *Local Competition Order*, ¶ 743.

555/ *See* Exh. No. 301TC 14:20-15:5 (Verizon Panel Reply).

2. Switching Inputs

Switch Discount. Verizon NW used the actual switch discount that it will receive when purchasing the latest available digital switching technology in the future.[556/] This assumption is the most accurate indicator of forward-looking costs, and has been ratified by the FCC, which has concluded that predictions based on information other than the current contracts would be inherently inaccurate.[557/]

Though AT&T does not explicitly attack Verizon NW's switch discount assumption, it appears to believe that TELRIC requires that all switching equipment be purchased as "new" switch purchases and receive the extraordinarily high new switch discount.[558/] This approach conflicts with the discounts that Verizon NW could actually achieve and with TELRIC principles. As Drs. Shelanski and Tardiff explained, vendors only offer the very high new switch discounts because they expect carriers to purchase a much larger percentage of growth additions, which are priced at relatively higher prices.[559/] If a carrier attempted to purchase all, or most, of its switching capacity at new switch prices, vendors would have no choice but to reduce the discount levels for new switches from those they offer today.[560/] In addition, the "all new" approach conflicts with the FCC's pronouncement that such an assumption is not required under

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556/ *See* Exh. No. 201TC 83:7-8, (Verizon Panel Direct).

557/ *See Kansas/Oklahoma § 271 Order,* ¶ 77.

558/ *See* Exh. No. 803T 9:21-10:2, (Gillan/Chandler) (comparing Verizon's proposed switching investments with new switch purchases and arguing that Verizon's proposal is overstated). In addition, AT&T and MCI's proposed model assumes nearly all new switch purchases. *See* Exh. No. 501T at 84:8-9, (Tardiff).

559/ *See* Exh. No. 1T 13:16-14:12, (Shelanski); Exh. No. 501T 84:16-20, (Tardiff).

560/ As the D.C. Circuit has noted, "growth additions to existing switches cost more than new switches *only because* vendors offer substantial new switch discounts in order to make telephone companies dependent on the vendors' technology to update the switches." *AT&T Corp. v. FCC*, 220 F.3d 607, 618 (D.C. Cir. 2000) (emphasis added).

TELRIC and would in fact understate forward looking costs. As the FCC argued to the Supreme Court, "TELRIC . . . does *not* assume that an efficient carrier would provide the switching element with [all new] large-capacity switches, rather than with a mix of smaller switches and so-called 'add-on modules.'"[561/]

Additional Switching Inputs. Although AT&T raised additional issues regarding Verizon NW's switching studies, all but one of these fail to demonstrate any flaw in these studies.[562/] First, Verizon NW's switching studies make reasonable assumptions regarding the number of trunks in the switching network. AT&T claims that Verizon NW should have assumed more busy-hour traffic per trunk, which would in turn lower the number of required trunks.[563/] As Verizon NW explained, AT&T's proposal would work only if Verizon NW had complete control over the placement of trunks in its network. But in today's current competitive environment and for the foreseeable future, a significant number of Verizon NW's trunks are ordered and used by other carriers as interconnection trunks for both local and long distance traffic. The number and locations of trunks placed in service for these other carriers is determined by the ordering carrier, *not* by Verizon NW's traffic engineers. Because Verizon NW is obligated to satisfy CLEC, IXC, and wireless demand for trunks on its network, it is impossible for Verizon NW to deploy its network trunking fields in the ideally efficient

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561/ Reply Brief for Petitioners United States and FCC, *Verizon Communications, Inc. v. FCC*, 535 U.S. 467 (2002), 2001 WL 881216, at 9 n.7. In addition, if next to no growth or upgrade purchases are assumed, as AT&T advocated, the model would have to account for significant additional spare capacity. *See* Exh. No. 501T 85:14-20, (Tardiff). The HM 5.3 model fails to do so. *See id.* at 36.

562/ AT&T did point out one error in Verizon NW's switching studies — the overstated number of DS1 umbilicals — and Verizon NW explained that it would correct this error when it submits a compliance cost study. *See* Exh. No. 228TC 91:13-20, (Verizon Panel Rebuttal).

563/ *See* Exh. No. 803T 8:16-22, (Gillan/Chandler).

hypothetical manner that AT&T assumes.[564/] The Commission should therefore adopt Verizon NW's proposed trunking assumptions, which are nearly identical to the per-trunk usage levels Verizon NW actually experiences in its network today, and reject the approach advocated by AT&T, which ignores demand for trunks from other carriers.[565/]

Second, Verizon NW appropriately included costs for umbilicals and SS7 in its proposed switching rates. With respect to "umbilicals," which link together a host and remote switch, AT&T argues that these are not properly recovered through switching rates and should instead be recovered through transport rates.[566/] But remote switch modules operate only as part of an integrated whole with their associated host switches. The purpose of a remote switch module, which contains only line equipment, is to expand the geographic area that can be served by a host switch and eliminate the "getting started costs" associated with a stand-alone end office switch at the remote switch site. The remote switch module has no central processor and depends on the host switch for all processing of calls that travel through the remote. Thus, contrary to AT&T's claims, the umbilicals are not transport facilities, but are simply intra-switch links that provide functions like the links that connect switch peripherals and the central control units located in the same physical building. For this reason, umbilical costs are properly recovered through UNE switching rates.[567/]

Likewise, Verizon NW appropriately included signaling costs in its proposed switching rates. Signaling is a critical part of switching functions: the signaling network performs the call

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564/ *See* Exh. No. 228TC 83:17-20, (Verizon Panel Rebuttal).

565/ *See id.*

566/ *See* Exh. No. 803T 7:5-11, (Gillan/Chandler). As Verizon NW has explained, AT&T's model simply ignores all host-remote relationships. *See* Exh. No. 551TC 138:9:15, (Murphy).

567/ *See* Exh. No. 228TC 85:20-86:4, (Verizon Panel Rebuttal).

set-up functions that occur on the network prior to the final disposition of a call. "Out-of-band" signaling, performed on the SS7 network, checks ahead to ensure that the called party is available before setting up the circuit switched path through the network, and is therefore an integral part of switching services. Without SS7 out-of-band signaling, this call setup functionality would conceivably revert back in-band signaling, the precursor to SS7 technology.[568/]

3. Minutes of use

To calculate its usage sensitive rates, Verizon NW appropriately assumed 2,000 monthly minutes per line. AT&T pointed to Verizon's 2003 ARMIS filing to support its claim that Verizon NW should have assumed a greater number of annual minutes per line.[569/] But the FCC eliminated the obligation that incumbent LECs measure Dialed Equipment Minutes (DEMS) in their ARMIS filings.[570/] As a result, the total DEMS on ARMIS reports filed after this change have been frozen at the year 2000 levels.[571/] Since Verizon NW is still required to file updated switched access *line counts* in its annual ARMIS reports, AT&T's approach ends up dividing the total DEMS in *2000* by the number of switched access lines in *2003*. Because switched access lines have been steadily *declining* since 2000, that mismatch significantly overstates the total annual minutes per line.[572/]

568/ *See id*. at 87:18-88:5. In addition, the amount of Verizon's investment in SS7 equipment is not a function of the number of active line ports in the network, but is instead driven by the number of call attempts for which SS7 must be used. It is therefore appropriate for SS7 costs to be recovered through the traffic sensitive rate rather than the monthly port rate. *See id.*

569/ *See* Exh. No. 803T 12:8-14, (Gillan/Chandler).

570/ *See* Exh. No. 228TC 82:5-8, (Verizon Panel Rebuttal).

571/ *Id.* at 82:8-10.

572/ *See id*.

B. Transport

Verizon NW's transport cost model uses bi-directional line switched SONET rings to provide IOF transport between Verizon NW wire centers.[573/] Verizon NW's capacity costing approach then models the forward-looking costs of providing IOF transport in an accurate and forward-looking manner. Verizon NW's methodology identifies the costs per unit of capacity of typical network configurations used to provide service, rather than trying to determine the total cost of the network used to provide those services.[574/] The cost per unit of capacity is then divided by a utilization factor to take into account the cost of spare capacity on the network.[575/] The Pennsylvania Public Utility Commission adopted this same approach for dedicated transport, noting that it had not been challenged by AT&T.[576/]

Nor did AT&T challenge it here. AT&T criticized only the IOF fiber fill factor used by Verizon NW. Verizon NW applied a **[VERIZON NW PROPRIETARY BEGIN] [VERIZON NW PROPRIETARY END]** utilization factor that is based on Verizon NW's current fiber utilization rate.[577/] In contrast, AT&T proposes a 100 percent fiber utilization factor.[578/] This proposal rests on the unsupportable assumption that a real-world network could be operational without any significant margin of spare capacity for fiber facilities.[579/] To the contrary, spare fiber facilities are absolutely essential for administrative and maintenance

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573/ *Id.* at 110:14-22.

574/ *Id.* at 109:13-20.

575/ *Id.* at 109:18-110:2.

576/ *Pennsylvania Final Opinion and Order* at 158.

577/ Exh. No. 201TC 119:6-12, (Verizon Panel Direct).

578/ Exh. No. 751TC 78:8-13, (Turner).

579/ Exh. No. 228TC 76:8-13, (Verizon Panel Rebuttal).

purposes, such as preventing ribbon failures and allowing for the staging of necessary splicing for cable movements and rearrangements, and to account for the phenomenon of breakage that even AT&T's witness has acknowledged.[580/] While AT&T relies on the FCC's Tenth Universal Service Order to support its position,[581/] the FCC has made clear that "we continue to discourage states from using the nationwide inputs [developed in the universal service context] for the purpose of developing UNE prices."[582/]

More importantly, however, HM 5.3's IOF (and switching) network does not model the actual volume of trunk facilities ordered by Verizon NW's customers.[583/] Because HM 5.3 cannot account for the actual volume of switched trunks and IOF, it fails to construct IOF with sufficient capacity to support the total demand handled by Verizon NW's network.[584/] The model outputs are telling: HM 5.3 models a mere 48,000 switched interconnection trunks,[585/] ignoring completely wireless and CLEC demand for such trunks and resulting in an astounding **[BEGIN**

580/ *Id.* at 74:15-21; *see also* Exh. No. 451T 60:12-16, (Richter).

581/ Exh. No. 751TC 77:2-78:2, (Turner).

582/ *TELRIC NPRM,* ¶ 46.

583/ Exh. No. 551TC 117:19-119:3, (Murphy). AT&T attempts to estimate demand for services (such as switched access) using ARMIS-reported dial equipment minutes ("DEMs") rather than actual demand. *Id.*at 110:18-21. Moreover, despite having attempted to remedy the model's previous assumption that 100 percent of all switched carrier interconnection is routed to an IXC POP, as opposed to the trunks and entrance facilities (and locations) utilized by the many carriers with whom Verizon NW does business (e.g., IXCs, CLECs, and wireless carriers), HM 5.3 fails to assign any of the non-switched, point-to-point interoffice, intraLATA demand correctly. *Id.* at 112:5-12. This errors infects nearly 92 percent of the dedicated access trunks modeled by HM 5.3, and results in a significant understatement of the trunks demanded of Verizon NW and associated UNE cost estimates. *Id.* at 112:8-12.

584/ *Id.* at 117:19-118:11.

585/ This figure includes both end office direct switched access trunks and tandem-switched access trunks (i.e., access dedicated and access tandem trunks).

VERIZON NW PROPRIETARY] **[END VERIZON NW PROPRIETARY]** fewer switched trunks than the amount actually ordered by Verizon NW's interconnecting carriers.[586/]

Even if HM 5.3's approach to modeling interoffice facilities did not suffer from the aforementioned flaws, it is far from clear that HM 5.3's IOF module is capable of producing meaningful results. HM 5.3's method of determining "optimal" interoffice SONET rings is insensitive to both the demand that it considers (i.e., traffic volumes entering or exiting a ring at each wire center) and the costs for fiber cable and electronics. Thus, there is serious question as to what exactly is being "optimized."[587/] For example, as Dr. Tardiff demonstrated, removing all of the demand associated with high-capacity loops (about two-thirds of the demand HM 5.3 assumes in designing and costing interoffice rings) resulted in an *identical* ring configuration and little change in investment levels.[588/] The ALJ in the ongoing SBC California UNE proceeding concluded, "we find that we cannot overcome criticisms of the HM 5.3 Transport module that it underestimates demand for interoffice transport, may not adequately incorporate optical interface equipment for the provisioning of high capacity services, and is insensitive to demand changes."[589/]

C. Other UNEs

Consistent with the Commission's revised issues list in the *Twenty-first Supplemental Order* in this docket, Verizon NW also proposed rates for four-wire analog loops, copper and multi-unit dwelling subloops, ISDN loop extenders, dark fiber, high-capacity DS1 and DS3

586/ Exh. No. 551TC 37:31-38:3, (Murphy).

587/ Exh. No. 501T at 80:12-16, (Tardiff).

588/ *Id.* at 80:17-81:9.

589/ *SBC California Proposed Decision* at 62.

loops, intrabuilding riser cables, and NIDs.[590/] No party has filed testimony challenging any of these rates, except for DS1 and DS3 loops and NIDs.

In contrast, Verizon NW has identified numerous problems with AT&T's proposed rates for DS-1 and DS-3 loops. AT&T has inappropriately excluded from its cost and demand estimates those DS-1s that are currently provisioned on an all-fiber basis, thereby inappropriately excluding millions of dollars in investment and costs, as well as thousands of units in DS-1 demand from its DS-1 UNE cost estimates.[591/] While DS-1 and DS-3 loops are the only high-capacity loops for which costs are being developed in the instant proceeding, the existence (or absence) of other high-capacity loops (e.g., OC-3, OC-12, OC-48, and OC-192), and their associated equipment, has a profound effect on the way in which the DS-1 and DS-3 loops are modeled and costed.[592/] Completely fiber-based DS-1 and DS-3 loops are generally provisioned as part of loop systems with much higher capacities, and typically use the same fiber strands as other high-capacity loops and loop systems.[593/] Only by accounting for the total capacity of these loop systems (which HM 5.3 fails to do) can truly accurate DS-1 and DS-3 UNE costs be developed.

Moreover, HM 5.3 is devoid of demand information relating to the total quantities (much less the customer location specific quantities) of the specific types (i.e., speeds) of high-capacity loops ordered by Verizon NW's customers — information that is absolutely essential to properly sizing, designing, and costing the loop systems from which the DS-3 and DS-1 loops, and their

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590/ Exh. No. 226TC, Attachment A-2.

591/ Exh. No. 551TC 91:12-92:9, (Murphy).

592/ *Id.* at 93:14-94:18.

593/ *Id.* at 94:9-18. As noted above, Mr. Spinks's proposal to create separate rates for four-wire loops in this proceeding is entirely unnecessary. *See* note 543 *supra.*

associated costs, are derived.[594/] As such, it essentially guesses at where these high-capacity services are located, and in the process significantly underestimates the facilities and equipment needed to provision the DS-1 and DS-3 loops being modeled.[595/]

IX. TAKINGS EVIDENCE

Verizon NW has provided substantial evidence showing that AT&T's proposed rates would not even come close to allowing Verizon NW to recover its unrecovered investment, as well as actual operating costs, that it incurs in providing UNEs, and thus would violate both the Act and the U.S. and Washington Constitutions. Indeed, if the Commission were to adopt AT&T's proposed rates, these rates would result in a monthly loss to Verizon NW of $30.19 for every UNE-P Verizon NW provides to CLECs and $19.80 per month for every UNE loop.[596/]

A. Legal Argument

AT&T's suggestion that the Commission can disregard Verizon NW's evidence that AT&T's rate proposals are confiscatory must be rejected out of hand. The Commission is required under the 1996 Act to establish UNE rates that are just and reasonable.[597/] As the U.S. Supreme Court has repeatedly recognized, rates can be just and reasonable only to the extent they are compensatory.[598/] In other words, as the Supreme Court emphasized not long ago, the

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[594/] *Id.* at 96:11-97:3.

[595/] *Id.* at 94:9-16.

[596/] Exh. No. 57T 2:8-9, (Dye).

[597/] 47 U.S.C. §§ 251(c)(3), 252(d)(1).

[598/] *See In re Permian Basin Area Rate Cases*, 390 U.S. 747, 769-70 (1968); *Federal Power Comm'n v. Natural Gas Pipeline Co*., 315 U.S. 575, 586 (1942).

1996 Act prohibits confiscatory UNE rates.[599/] And the Commission, both in its own right and as an agent of the federal government in setting UNE rates, is constitutionally required to set rates that do not create an unauthorized taking.[600/]

A regulatory agency has considerable discretion in adopting a ratemaking *methodology*. But the resulting rates must be evaluated to ensure that they preserve the utility's constitutional entitlement to be compensated for the capital dedicated to public use. Thus, Verizon NW is not arguing, as AT&T suggests, that the Commission's TELRIC standard is itself unconstitutional because it is based solely on forward-looking costs.[601/] But the mere fact that rates might comply with TELRIC (which, in any event, AT&T's do not) does not establish that those rates are constitutional. That is a separate inquiry, and one, as the Supreme Court recognized in *Verizon*, that takes as its starting place the actual rates determined by the ratesetting methodology, and scrutinizes them to determine whether they are constitutionally sufficient. The Supreme Court's holding in *Duquesne Light Co. v. Barasch*, 488 U.S. 299, 309 (1989), confirms that in conducting that analysis, recovery of prudent investment is the appropriate constitutional benchmark.[602/]

599/ *Verizon Communications, Inc. v. FCC*, 535 U.S. 467, 489 (2002) (Act permits "novel ratesetting designed to give aspiring competitors every possible incentive to enter local retail telephone markets, *short of confiscating the incumbents' property*" (emphasis added)).

600/ U.S. Const. amends. V; XIV; Wash. Const. art. 1, § 16. *See also US West Communications, Inc. v. Wash. Util. and Transp. Comm'n*, 134 Wash.2d 48, 69 (1997) ("[T]he guiding principle in rate cases [is] . . . that the Constitution protects utilities from being limited to a charge for their property serving the public which is so unjust as to be confiscatory.") (internal quotation marks omitted); *People's Org. for Wash. Energy Res. v. Wash. Util. and Transp. Comm'n*, 104 Wash.2d 798, 812 (1985) ("[There is a constitutionally based floor below which a rate . . . set by a regulatory agency will be reversed by the courts as confiscatory.")

601/ Exh. No. 1001TC 4:5-5:17, (Lundquist).

602/ *See also Duquesne*, 488 U.S. at 317 (Scalia, J., concurring).

Constitutionally sufficient rates must provide not only for unrecovered past prudent investment, but also for *all* costs reasonably and necessarily incurred to provide the regulated service — including the operating costs that the regulated entity necessarily incurs to provide service. When the government compels the ongoing production of service by a private party, the compensation provided must cover the unavoidable costs of producing that service. In the case of UNEs, the incumbent is compelled to offer, maintain, and operate facilities for the benefit of a third party. In the process of doing so, Verizon NW will incur unavoidable operational and investment costs. The government is not constitutionally free to ignore such costs.[603/]

Nor is there any merit to AT&T's insistence that evidence of constitutional insufficiency should not be considered during the rate-setting process itself.[604/] As the U.S. Supreme Court has made clear, it is perfectly appropriate to hear evidence that "particular, actual TELRIC rate[s]" constitute a taking. In fact, the D.C. Circuit has determined that an agency commits reversible error when it implements rates without first considering evidence proffered to show that those rates are confiscatory.[605/]

603/ *United States v. Pewee Coal Co.*, 341 U.S. 114, 117-18 (1951) ("When a private business is possessed and operated for public use, no reason appears to justify imposition of losses sustained on the person from whom the property was seized."); *United States v. General Motors Corp.*, 323 U.S. 373, 379-83 (1945) (holding that when property is occupied by government mandate, the owner is entitled to recover his actual costs based on his particular circumstances).

604/ *See* Exh. No. 1004TC 4:13-17, (Lundquist).

605/ *See Jersey Cent. Power & Light Co. v. FERC*, 810 F.2d 1168 (D.C. Cir. 1987) (*en banc*) (holding that, because the agency "flatly refus[ed] to consider a factor to which it is undeniably required to give some weight [*viz.*, the confiscatory effect of its rate order], its decision cannot stand."). *See also Missouri Pub. Serv. Comm'n v. FERC*, 337 F.3d 1066, 1074 (D.C. Cir. 2003) ("We agree with the Commission that it was obligated 'to consider the impact the initial rates would have on Kansas Pipeline's financial integrity'" (*citing, inter alia*, *Jersey Central*)); *see also Algonquin LNG, Inc. v. FERC*, 570 F.2d 1043, 1050-51 (D.C. Cir. 1978) (rate order must be set aside because agency "disregard[ed] . . . whether the imposed rate was confiscatory" and provided no opportunity for regulated party to demonstrate its confiscatory effect).

B. Cost Evidence

Verizon NW's evidence shows that the rates proposed by AT&T are confiscatory because they do not enable Verizon NW to recover the costs that it necessarily incurs to provide UNEs, including its unrecovered past prudent investment and its actual operating costs. Specifically, Verizon NW's study shows that its monthly recurring cost to provide CLECs with the facilities used to provide UNE-P is $42.16, and its recurring cost to provide a stand-alone loop is $27.44.[606/] These costs are substantially above the $11.97 UNE-P and $7.64 loop recurring rates proposed by AT&T.[607/] Indeed, if the Commission were to adopt AT&T's proposed rates, these rates would result in a monthly shortfall of $30.19 for every UNE-P Verizon NW provides and $19.80 per month for every UNE loop.[608/] Verizon NW has thus presented evidence proving that AT&T's proposed UNE rates would not even come close to enabling Verizon NW to recover its actual operating costs, let alone its unrecovered past prudent investment. Because AT&T's proposed rates would provide compensation that falls far short of the constitutional benchmark, these rates must be rejected.

AT&T's criticism of Verizon NW's use of the FCC's prescribed cost of capital is unfounded.[609/] As Verizon NW made clear in its testimony, it used the FCC's cost of capital figure of 11.25 percent in its analysis because that figure is conservative.[610/] Indeed, the

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606/ Exh. No. 57T 2:3-6, (Dye).

607/ *Id.* Although AT&T has now increased its proposed loop rate, the increase is less than $1 and still leaves a gaping shortfall. *See* Tr. 1478:15-18 (Mercer) (indicating that the change to HM 5.3 increased the loop cost from $7.64 to $8.50 (an 84 cent difference)).

608/ Exh. No. 57T 2:8-9, (Dye).

609/ *See* Exh. No. 1004TC 9:1-2, (Lundquist).

610/ *See* Exh. No. 57T 8:12-14, (Dye).

appropriate cost of capital for the provision of UNEs is much higher because (as discussed earlier in this brief) the cost of capital for UNEs should reflect a risk premium designed to account for the substantial risks inherent in the UNE and TELRIC regimes.[611/] Verizon NW used the 11.25 percent cost of capital in an effort to be noncontroversial, since it is the FCC's own chosen figure. AT&T's attack of this number is thus entirely baseless; in fact, this figure results in an understatement of Verizon NW's costs.

AT&T's other criticisms of Verizon NW's cost study, designed to convince the Commission that it can simply ignore the vast insufficiency of AT&T's own rate proposal, miss the forest for the trees. Even if Verizon NW's study were adjusted to account for each of AT&T witness Lundquist's proposed changes, AT&T's proposed rates would still be dramatically below Verizon NW's costs. For example, leaving aside the legitimacy of his criticisms, if Mr. Lundquist's proposed adjustments were made, the resulting estimate of Verizon NW's cost of providing a UNE loop would still be approximately $23.66 — roughly *three times* AT&T's proposed UNE loop rate.[612/] Of course, to the extent that the Commission concludes that any of AT&T's specific criticism is legitimate, Verizon NW will make this adjustment and file a revised study. But none of the criticisms raised by AT&T even purports to undermine the central thrust of Verizon NW's evidence: that AT&T's proposed rates fall well below Verizon NW's costs and thus cannot be adopted.

611/ *Id.*

612/ This calculation does not account for Mr. Lundquist's proposed adjustment concerning the allocation of land and support investment. Verizon NW's preliminary calculations, however, show that this adjustment would have a *de minimis* effect on the results of Verizon NW's study.

CONCLUSION

For the reasons set forth above, the Commission should adopt VzCost as the appropriate cost model for Verizon NW's UNE rates, and approve the UNE rates proposed by Verizon NW.

Respectfully submitted,

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