investment for the service and then applied the annual cost factors.[112] (VZ-VA Ex. 107 at 216-221.)

To calculate per mile costs, Verizon VA used fiber cable investment data from its VRUC database and then converted mileage costs from actual route miles to air miles. (VZ-VA Ex. 107, Attachment B at 46.)

2. Verizon VA's IOF Cost Model Uses Forward-Looking Assumptions About SONET Ring Architecture.

Verizon VA based its cost calculations for the IOF electronics investment on several forward-looking assumptions. Verizon VA assumed that transport would be provided exclusively on all-fiber OC48 bi-directional line switched SONET rings. (VZ-VA Ex. 107 at 220; Tr. at 5628.) Verizon VA further assumed that the typical, forward-looking ring would have six nodes. This assumption reflects an appropriate, forward-looking balance between two options: with fewer nodes per SONET ring, it often is possible for a greater number of circuits (measured in DS3 equivalents) to enter and exit the ring. However, smaller rings typically require a greater number of costly interconnections (called intermediate channel terminations) to complete transport circuits, because it is less likely that both end points of a circuit will be located on the same ring. Intermediate channel terminations are a major cost in the SONET network due, among other things, to the need for additional ports per circuit, DCS equipment, and labor. (VZ-VA Ex. 122 at 150, 152-54.)

Conversely, SONET rings with more nodes generally require fewer interconnections and allow for enhanced growth-demand flexibility. (VZ-VA Ex. 122 at 151-52.) However, larger

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[112] For entrance facilities, Verizon VA proposes a fixed monthly charge to recoup its forward-looking costs associated with providing CLECs access to those facilities, assessed using a similar methodology.

rings are more difficult to load without exhausting the fixed line capacity between adjacent nodes. As Mr. Gansert explained to the Commission, the group of Verizon experts and circuit design engineers that designed the model considered these competing concerns and concluded that "[t]he six node ring configuration was . . . the best representation of cost in an efficiently designed network." (Tr. at 5628.) The six nodes-per-ring assumption is the same one adopted in several state Section 252 proceedings.[113]

The primary parameter necessary to calculate per mile costs is the typical length of a SONET ring. Mr. Gansert explained that, just as with the loop cost study, "[t]he distance element needs to be reflective of the local geography to some extent." (Tr. at 5628.) Verizon VA accordingly assumed that in the forward-looking network, the ring dimensions would mirror the dimensions of rings in the existing network, "since the same places have to be connected." (Tr. at 5629.) Because Verizon VA only maintains data on the average distance *between* nodes on its SONET rings (but not the average *total* ring length), Verizon VA calculated the average total ring length by multiplying the average distance between nodes by the average number of nodes per SONET ring. (VZ-VA Ex. 122 at 154-55.) For these purposes, Verizon VA used an average of 3.79 nodes per ring, a figure that understates the actual number of nodes per ring for all rings in Virginia because it does not include nodes located outside of Virginia on rings that cross the border into other jurisdictions (such as Washington, D.C. or suburban Maryland). (*See* VZ-VA Ex. 179.) Thus, the 3.79 nodes per ring assumption produces an estimate of the forward-looking average ring length that likely is understated.

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[113] *See, e.g.,* Recommended Decision at 150; *In re Board's Review of UNE Rates, Terms and Conditions of Bell Atlantic New Jersey, Inc.*, Docket No. TO00060356, Summary Order of Approval (Dec. 17, 2001).

3. AT&T/WorldCom's Criticisms of Verizon's IOF Cost Model Are Without Merit.

AT&T/WorldCom originally alleged in their written testimony that they were unable to determine the basis for the assumption in Verizon VA's fixed cost calculations that SONET rings would have 16 ports per node, and suggested that Verizon VA had made a contorted miscalculation that failed to account for the requisite two ports per DS3 circuit on each ring. This criticism rang hollow at the time, given that Petitioners themselves acknowledged that Verizon had used the same IOF costing methodology in the New York UNE proceeding — in which Verizon already had responded to and refuted this same criticism.[114/] (*See* AT&T/WCom Ex. 12 at 128-29, 129 n.122.) Not surprisingly, after once again receiving Verizon VA's cogent explanation of its IOF calculations (VZ-VA Ex. 107 at 148-56), AT&T/WorldCom appear to have abandoned their attack, which was not even raised at the hearing.

Petitioners' remaining attack on Verizon VA's IOF cost model appears to be that not only the distance sensitive costs, but also the fixed cost calculations should have been based on the average number of nodes on Verizon VA's existing SONET rings because, as Mr. Turner testified, "you have to look at what is Verizon's current experience" to determine the forward-looking number of ports per node. (Tr. at 5630-5631; AT&T/WCom Ex. 12 at 128-29.) Of course, Verizon VA agrees with this contention: we have explained throughout these proceedings that the current network must be the starting place for any forward-looking assumption if that assumption is to have any value. And indeed, Verizon's engineers based their assumptions with respect to the forward-looking IOF network on their experience operating the

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114/ Indeed, New York is not the only state in which AT&T and/or WorldCom have raised this issue. As Mr. Gansert explained to the Commission, "the same issue has come up and been explained in detail in our testimony" in the other states where Verizon has filed its IOF model. (Tr. at 5630.)

existing network and serving IOF demand. Petitioners' insistence that the fixed costs of the forward-looking IOF network can simply be based on existing average node costs demonstrates a total absence of familiarity with IOF requirements and cost drivers and is significantly misguided.

First, while Petitioners appear to believe that smaller rings with few nodes are always more economical, this is simply not the case. As Verizon VA explained in its testimony, factors such as "the enhanced capabilities of the latest generation of SONET technology and operations" would make it economical to use larger rings than are used in the existing network. (VZ-VA Ex. 122 at 152.)

Second, AT&T/WorldCom's proposed input change entirely ignores the substantial costs associated with higher rates of SONET ring interconnection associated with such smaller rings. As Mr. Gansert explained at the hearing:

> [T]he model['s fixed cost inputs] need[] to be internally consistent. You cannot just change one parameter and not change the other. The model that was selected is a consistent estimate between the average load on the ring, the number of nodes, and the amount of interconnection between rings, all of which have a major effect on the cost of the network. So, you just can't—you just can't look at [the total number of ports] and say gee if you had to divide it by 3.79 instead of six.

(Tr. at 5633.) Rather, a change in the assumption concerning the number of nodes per ring would require an increase in the intermediate channel terminations input to reflect the greater number of ring interconnections that would be required for each circuit.[115] (VZ-VZ Ex. 122 at 150-51.) Thus, AT&T/WorldCom's proposal to increase the number of ports per node in the

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[115] "[T]he smaller the rings clearly the more rings you are probably going to have to traverse to get from point to point." (Tr. at 5644; *see also* VZ-VA Ex. 122 at 150 ("Increasing the number of nodes on a SONET ring in turn increases the probability that a DS3 circuit can be created between two offices without having to use more than one ring.").)

fixed cost calculations without increasing the number of required interconnections would produce an understatement of forward-looking transport costs.

Third, as Mr. Gansert explained, the assumption of an average of 3.79 nodes per ring would not automatically result in an average *cost* across the network of a 3.79-node ring, given that there are so many variables that would affect the costs of any particular ring configuration: "The cost of two node rings versus eight node rings, it is not a linear relationship." (Tr. at 5632.) For these and other reasons, AT&T/WorldCom's arguments do not justify disregarding the judgment of Verizon's SONET engineering experts about the forward-looking configuration of the SONET network. And in the view of those experts, as Mr. Gansert testified, "the six node ring represented the best estimate in general of the cost of traversing SONET rings."[116/] (Tr. at 5632.)

Finally, AT&T/WorldCom also criticize Verizon VA's EF&I factor for transmission transport equipment, but here too their contentions are misplaced. The 53.2% in-place factor that Verizon VA uses in this proceeding was derived from its actual 1998 accounting data with its own network *in Virginia*. (VZ-VA Ex. 122 at 156-57.) In contrast, AT&T/WorldCom offer no substantiation for their argument that the proper EF&I should be "in the 30% range." (AT&T/WCom Ex. 12 at 138.) While AT&T/WorldCom attempt to make much of the fact that Verizon utilized a 36.4% in-place factor in the New York UNE proceeding, that figure was based on the specific mix of equipment installed in New York in that particular year, which is quite different from the equipment placed in Virginia in 1998. The former accounted for a larger

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[116/] Verizon VA employed appropriate common transport costs in its studies, which AT&T/WorldCom restate based only on their criticisms of Verizon VA's dedicated transport studies. For the reasons stated in this section, those criticisms are without merit, and Verizon VA's common transport rates accordingly are reasonable and well-supported in the record.

investment amount, leading to a smaller EF&I, that cannot simply be applied to the very different Virginia investment. (VZ-VA Ex. 122 at 158-59.)

C. Access To OSS Charges

AT&T/WorldCom have one primary criticism of Verizon VA's approach for recovering the costs of providing the Access to OSS UNE: in contrast to all other UNEs, Verizon VA should not be permitted to recover its costs from the CLECs that order and use the UNE.[117] This flies in the face of the law and basic cost recovery principles and would be manifestly unfair to Verizon VA. OSS costs should be recovered from those who have caused and will continue to cause Verizon to incur those costs — the CLECs. Moreover, although AT&T/WorldCom allege generally that Verizon VA did not support its Access to OSS costs, or may have double counted costs, they offer no evidence to support these challenges. In short, Petitioners have neither demonstrated any reason why Verizon VA should not be entitled to recover in full its costs of providing the Access to OSS UNE nor proposed any basis for recalculating Verizon's Access to OSS costs.

1. Access to OSS Costs Are Forward-Looking UNE Costs That Should Be Recovered from the CLECs.

In 1996, at the insistence of AT&T/WorldCom and other CLECs, the Commission explicitly defined Access to OSS as a UNE.[118] The Supreme Court upheld the Commission's

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[117] Access to OSS issues are addressed in VZ-VA Ex. 107 at 242-97; VZ-VA Ex. 122 at 212-48, and VZ-VA Ex. 117 at 35-40.

[118] *See Local Competition Order* at 15763 ¶ 516 ("We conclude that operations support systems and the information they contain fall squarely within the definition of 'network element.'"); *see also id.* at 15752-15768; 47 U.S.C. § 153(a)(45).

decision to treat OSS as a network element.[119] Accordingly, under Commission rules and the Act itself, the rates for OSS, as for any other UNE, must cover its costs.[120] As the Commission noted, "the 1996 Act requires a requesting carrier to pay the costs of unbundling, and thus incumbent LECs will be fully compensated for any efforts they make to increase the quality of access or elements within their own network."[121] (*See* VZ-VA Ex. 117 at 36.) Moreover, economic principles dictate that such costs should be recovered from the cost causers; otherwise, the Commission will encourage inefficient entry and inefficient development of OSS. (*See* VZ-VA Ex. 117 at 36-37.)

AT&T/WorldCom argue that each party should bear its own costs or that Access to OSS costs should be treated as a cost factor rather than recovered from the users of OSS. (AT&T/WCom Ex. 12 at 143, 145; 163-64.) What Petitioners are unable to answer, however, is the Commission staff's pertinent question: "How do we square that treatment . . . with [the] argument that [Access to OSS] is an unbundled element, and under the Act there has to be a cost base[d] price for the element?" (Tr. at 3960.) AT&T/WorldCom's suggested answer — that Access to OSS costs is a "competition-onset cost" (*see* AT&T/WCom Ex. 12 at 145) — simply begs the question of who should pay those costs. Under the Act and Commission rules, Verizon VA is entitled to collect Access to OSS costs from CLECs who use that UNE.

Moreover, despite Petitioners' efforts to portray OSS development as simply a cost of doing business that Verizon incurred as part of the new competitive environment (AT&T/WCom Ex. 12 at 145), Verizon's costs for developing Access to OSS were not incurred to serve

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119/ *See AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366, 386 (1999).

120/ *See* 47 U.S.C. § 252(d)(1).

121/ *Local Competition Order* at 15659-60 ¶ 314.

Verizon's own needs, but rather to serve the CLECs' needs. The Commission has explicitly ruled that CLECs should pay for OSS modifications incurred on their behalf, finding that it is appropriate for incumbent LECs to recover the costs of modifying their OSS for line sharing from the CLECs: "incumbent LECs should recover in their line sharing charges those reasonable incremental costs of OSS modification that are caused by the obligation to provide line sharing as an unbundled network element."[122] The outcome should be no different here. As one federal district court noted in upholding the Kentucky Public Service Commission's decision requiring AT&T to pay for development of BellSouth's electronic interface development for OSS:

> Because the electronic interfaces will only benefit the CLECs, the ILECs, like BellSouth, should not have to subsidize them. . . . AT&T is the cost causer, and it should be the one bearing all the costs; there is absolutely nothing discriminatory about this concept.[123]

Indeed, through their participation in the Industry Change Control process, the CLECs themselves largely determined what modifications to Verizon's OSS were necessary. (*See* VZ-VA Ex. 122 at 215.) In light of their extensive involvement in determining the magnitude of costs Verizon incurred, the CLECs should not be permitted to avoid their obligation to pay for Access to OSS.

AT&T/WorldCom also seek to avoid paying for Access to OSS on the theory that any cost incurred after the Act, or at least after the *Local Competition Order* (but before these

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[122] Sixth Report and Order in CC Docket Nos. 96-262 and 94-1, Report and Order in CC Docket No. 99-249, Eleventh Report and Order in CC Docket No. 96-45, *In the Matter of Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Low-Volume Long Distance Users; Federal-State Joint Board on Universal Service,* 15 FCC Rcd 12962, 13022 ¶ 144 (2000).

[123] *AT&T Communications of the South Central States, Inc. v. Bell South Telecommunications, Inc.*, 20 F. Supp. 2d 1097, 1104-05 (E.D. Ky. 1998).

proceedings), is "embedded" and unrecoverable in UNE rates, even though it was incurred specifically on behalf of CLEC's competitive needs. (AT&T/WCom Ex. 12 at 153-54.) But this argument simply seeks to take advantage of the timing of these proceedings. Verizon's OSS are designed to serve the needs of providing CLECs with access to a cutting-edge network, and they reflect the most forward-looking technology currently deployed.[124] (*See* VZ-VA Ex. 107 at 247-48.) The costs of developing new systems and modifying existing systems cannot be dismissed as "embedded" merely because they were developed or incurred prior to these proceedings. By that logic, if Verizon had simply dragged its feet and failed to develop Access to OSS in a timely manner, Verizon would have improved its chances of recovery in these proceedings by incurring its costs later and avoiding the "embedded" label. It makes no sense to penalize Verizon for developing Access to OSS in a timely manner by denying recovery of those development costs now.[125]

Perhaps recognizing the flaws in their proposal that Verizon be left to bear its costs alone, AT&T/WorldCom argue in the alternative that the Access to OSS costs be treated akin to other so-called "regulatory costs," such as number portability costs, and recovered through charges on all end users. But the comparison to number portability cost recovery is unavailing. Congress

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[124] AT&T/WorldCom suggest that Verizon VA is improperly seeking to recover costs for interim or obsolete systems. (*See* AT&T/WCom Ex. 12 at 164-65; Tr. at 3914-21.) However, as Verizon explained, these systems were forward-looking at the time they were implemented; moreover, as with Microsoft's Windows, software and systems build upon previous versions as they develop and advance. The developments of the first generation are incorporated into the next generation, and thus continue to be used. (*See* VZ-VA Ex. 122 at 235.)

[125] In effect, the argument would create a timing bar to ever recovering OSS development costs. If the development is done prior to the cost proceeding, the CLECs can argue that the costs are embedded; if the development has yet to be done, the costs would no doubt be criticized as entirely speculative and contested on that basis.

imposed a specific cost recovery requirement for number portability;[126] Access to OSS, in contrast, is a UNE subject to the rules governing cost recovery for *all* UNEs. (*See* VZ-VA Ex. 122 at 223-24; Tr. at 3967-69.) UNE costs are to be recovered from the CLECs through cost-based rates, and there is no justification for departing from that statutory standard here. (*See* VZ-VA Ex. 117 at 39-40.) Indeed, one state commission has recently rejected this very argument and found that OSS costs should be recovered from the CLECs:

> In response, we point out that Section 251(e)(2) of the Act gives state commissions explicit direction on how number portability transition costs should be recovered. No such explicit recognition is given to the treatment of OSS costs. We believe that if Congress had intended OSS costs to be treated in a fashion analogous to number portability, Congress would have included comparable statutory direction and would not have allowed OSS rates to be included in the same pricing category as other unbundled network elements.[127]

Again, AT&T/WorldCom's argument simply fails to come to terms with the fact that Access to OSS is a UNE and, like other UNEs, incumbent LECs must be permitted to recover their "costs of unbundling" from those who order and use the UNE.[128]

2. Verizon Provided Substantial Support for Its Assessment of Access to OSS Costs.

Verizon VA offered extensive support for its Access to OSS costs. As explained in Verizon VA's testimony, the Access to OSS study identifies two types of costs: one-time

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[126] *See* 47 U.S.C. § 251(e)(2); Third Report and Order, *Telephone Number Portability*, 13 FCC Rcd 11701 ¶ 41 (1998).

[127] *See Thirteenth Supplemental Order Costing and Pricing of Unbundled Network Elements, Transport, and Termination*, Docket No. UT-0030313, 2001 WL 391520 (Wash. U.T.C., Jan. 31, 2001).

[128] *Local Competition Order* 15659-60 ¶ 314.

development costs and ongoing costs. (VZ-VA Ex. 107 at 273-93.) The one-time development costs, which were incurred between 1996 and 1999, include expenses associated with developing new system interfaces or gateways and modifying the underlying core systems. (VZ-VA Ex. 107 at 273-83.) The ongoing costs include Verizon's (1) annual capital and operating costs associated with the computer hardware necessary for providing Access to OSS and (2) software maintenance. (VZ-VA Ex. 107 at 283-93.)

a) Verizon Appropriately Documented the Amount and Reasonableness of Its One-Time Development Costs for Access to OSS.

In the Access to OSS study and the testimony, Verizon VA described the enormous changes required to provide Access to OSS and documented these one-time development costs. Verizon VA witness Lou Minion described the five OSS functionalities — pre-ordering, ordering, provisioning, maintenance and repair, and billing — and explained how Verizon had to modify the core OSS and the interfaces that allow CLECs to access Verizon's OSS. (VZ-VA Ex. 107 at 254-73.)

AT&T/WorldCom failed to provide any evidence demonstrating that Verizon did not incur the Access to OSS costs or that such costs were incurred inefficiently or improperly. Petitioners do nothing more than offer generalized allegations that Verizon failed to support the reasonableness of its Access to OSS costs (*see* AT&T/WCom Ex. 12 at 154-59); they point to no system change or functionality that was unnecessary or improper and identify no costs that were allegedly excessive. AT&T/WorldCom instead rely on their conclusory assertion that "Verizon's expectation that it would be able to pass along OSS development costs to competitors created an incentive for it to comply inefficiently." (AT&T/WCom Ex. 12 at 146.) These proceedings should ably demonstrate that Verizon has never been able to proceed with any

confidence that it would be able to recover in a UNE cost proceeding the costs it incurs in connection with *any* UNE, much less the Access to OSS costs. Given this pervasive uncertainty, it simply would have made no sense whatsoever for Verizon to have incurred costs inefficiently; indeed, it would have been sheer fantasy for Verizon to believe that it could easily recover *inefficient* costs in the face of scrutiny by CLECs and regulatory agencies. (VZ-VA Ex. 117 at 38.)

AT&T/WorldCom also allege generally that Verizon failed to support its costs (*see* AT&T/WCom Ex. 12 at 153-59), but this is untrue. Mr. Minion described in detail how Verizon identified and tracked Access to OSS costs using expense reports created for the Partnership Initiative Profile and the Keep Cost Order process to identify one-time development costs. (VZ-VA Ex. 122 at 228-34.) By using Verizon's existing financial reporting processes and systems to track Access to OSS costs, Verizon was able to identify those costs incurred in providing Access to OSS and ensure that they did not include costs for projects that benefited Verizon's retail operations.

b) Verizon Identified and Supported Its Reasonable Ongoing Access to OSS Costs.

Verizon VA also provided substantial support for its ongoing Access to OSS costs. As Mr. Minion explained, Verizon VA documented the ongoing costs it incurs for computer investments for hardware and for software maintenance. (*See* VZ-VA Ex. 107 at 283-93; VZ-VA Ex. 122 at 237-42.) AT&T/WorldCom quibble with Verizon's methodology but provide no principled critique. For example, AT&T/WorldCom claim that Verizon should have used 2001 or 2002 prices for computer investments rather than 1999 prices. But Verizon sensibly used 1999 prices for the mainframe equipment because Verizon assumed that the initial deployment of Access to OSS was completed at that time. (VZ-VA Ex. 122 at 240-241.) Thus, the capacity

costing approach used by Verizon, which uses the investment associated with the actual installed equipment, is the appropriate long-run investment measure. (*See* VZ-VA Ex. 122 at 241.)

3. Verizon VA Does Not Double Recover Access to OSS Costs.

Finally, AT&T/WorldCom contend that there is "probably some double counting with Verizon's recurring costs" and the Access to OSS costs (AT&T/WCom Ex. 12 at 143), but this allegation is woefully short on specifics. As Verizon VA explained in its testimony, there simply is and has been no double recovery. (VZ-VA Ex. 122 at 243-44.) Petitioners' general idea appears to be that because the information management systems expenses in the 1999 base year that Verizon used to calculate ACFs included OSS development expenses, Verizon's use of the relevant ACF to establish its recurring UNE rates would recover these OSS expenses. This confuses the concept and purpose of using ACFs to determine forward-looking expenses. As previously explained, although ACFs are calculated by looking to the expense levels in a particular year, they are used solely as an estimate of what the typical relationship of expenses to investment has been and likely will continue to be in the forward-looking network. ACFs, accordingly, are not used to recover any past expenditures; rather they predict the correct percentage of common and other expenses going forward.

Thus, even if some Access to OSS costs were included in the year for which the expenses were examined to develop the ACFs, the ACF would not recover Access to OSS costs. Instead, they would recover the most likely amount of information services expenditures in the forward-looking market. And the fact that Access to OSS costs were included in the base year and will not be incurred again does not mean that 1999 information services expenses are skewed or overstated. The information services budget for 2000 was *higher* than for 1999 (*see* Tr. at 3912), demonstrating that other projects have now reclaimed the dollars once spent on OSS. Indeed,

this also suggests that the use of 1999 expenses for ACF development, even including Access to OSS expenditures, was conservative.

Verizon also specifically ensured that the ongoing portion of the Access to OSS charge would not recover costs that would be recovered through ACFs. Verizon VA removed nearly $48 million in ongoing Access to OSS costs from the development of the Other Support ACF. Thus, the Other Support ACF does not recover the ongoing costs (*i.e.*, investment-related hardware costs and software maintenance costs) of providing Access to OSS.

D. Daily Usage File

Verizon VA provides CLECs with an optional daily usage file (DUF) service, under which, every time one of a CLEC's end users makes a call, Verizon sends a message to the carrier with information about the identity of the caller so that the carrier can bill its customers. Verizon VA's studies develop appropriate, forward-looking costs for this service and calculate a per-message DUF charge.

AT&T/WorldCom's primary criticism of Verizon VA's DUF costs is based on an outdated and invalid comparison. In particular, they assert that Verizon VA's costs are unreasonable because they are greater than the current rates in other Verizon-East states, which are based on an estimate of DUF expenses made by Verizon in 1996. But Verizon's 1996 estimate was made before Verizon actually provided the DUF service and when it accordingly had little information regarding what would be required to provide the service. Verizon now has more than four years of actual experience providing DUF service to CLECs, and its cost study in these proceedings reflects that greater experience and knowledge.

The most significant difference between Verizon's original DUF study and the one it has submitted here concerns estimated demand for this optional service. Since Verizon was not

actually providing the DUF service in 1996, its cost estimate was based entirely on an assumed demand without the benefit of any experience. The actual demand for DUF, however, has been much less than what Verizon estimated in 1996. Because many DUF expenses are fixed regardless of the amount of demand, Verizon VA's cost per message is necessarily higher than costs estimated based on the 1996 study. For example, as Mr. Minion testified, DUF requires a specific software maintenance agreement between Verizon VA and an outside vendor, and the price under this agreement does not vary based on customer volume. (Tr. at 3997-98.) Similarly, the difference between the demand anticipated in 1996 and actual demand has not resulted in a corresponding reduction in the number of employees required to perform DUF tasks. Rather, as Verizon has demonstrated through detailed evidence such as the precise number of employees involved in providing DUF, their responsibilities, their job function codes, and the percentage of their time spent on DUF, experience has demonstrated that the amount of labor required is more than originally anticipated. (Tr. at 4002; VZ-VA Ex. 122 at 209.)

V. THE UNSUBSTANTIATED COST ESTIMATES PRODUCED BY THE MODIFIED SYNTHESIS MODEL SHOULD NOT BE USED TO SET UNE RATES FOR VERIZON VA.

The unsubstantiated cost estimates generated by AT&T/WorldCom's MSM do not accurately reflect the forward-looking, TELRIC costs of providing UNEs in Virginia. Instead, the MSM's cost estimates are derived from an idealized, fantasy network that assumes levels of efficiencies and technology deployment that could never be achieved by any real-world local exchange service provider. The MSM is incapable of producing cost estimates for more than a handful of UNEs, and its platform is riddled with errors and omissions even with respect to the UNEs for which it can produce cost estimates. The MSM's input assumptions bear little or no relation to the cost of providing service in Virginia, are inconsistent with reasonable and widely-

accepted network design practices, and have never been verified against any real-word data. In short, the MSM not only models the cost of a network that is completely divorced from reality — it models the cost of a network that simply will not work.

The MSM is nothing more than a convenient adaptation of the Commission's universal service Synthesis Model, purposefully modified to produce even lower cost estimates than the Synthesis Model itself. The Synthesis Model was developed to allocate federal universal service funds among states based on *relative* cost differences, not state specific or company-specific UNE cost estimates. AT&T/WorldCom's self-serving modifications to make the Synthesis Model "UNE-compliant" (AT&T/WCom Ex. 14 at 3) only increase the significant distortions in the resulting UNE costs.

Even if the MSM's algorithms were not fatally flawed, the inputs and assumptions used in the MSM with respect to the design, operation, technology, investments, and expenses of the network are not grounded in reality and dramatically understate UNE costs. Petitioners use almost no data drawn from Verizon VA's extensive experience operating a network in Virginia or any other carrier's experience operating a real functioning network of any type. Their inputs are selected solely because they lower the MSM's cost estimates, with no evident concern for whether such inputs could possibly produce a functioning network capable of providing all necessary services at the requisite service quality levels.

For example, as noted above, and addressed more fully below, Petitioners use values for critical factors such as line counts, structure sharing, utilization, plant mix, and investments that are created out of whole cloth and have the expected, collective effect of reducing costs in the MSM dramatically. Ultimately, as noted above, the resulting $6.48 statewide average loop rate is $8.00 to 9.00 *less* than the rates the Commission approved as TELRIC-compliant in several

Section 271 proceedings, and is approximately $7 less than the rate set in Virginia just two years ago. That alone should raise significant questions about the MSM's underlying assumptions.

In fact, using the MSM, AT&T/WorldCom make the patently unreasonable claim that Verizon VA's entire Virginia network could be rebuilt for only *40%* of Verizon VA's existing investment (VZ-VA Ex. 154 (Table 3A); VZ-VA Ex. 108 at 36 (Table 3A)) and operated at nearly *30%* of Verizon VA's costs (VZ-VA Ex. 154 (Table 3B); VZ-VA Ex. 108 at 37 (Table 3B)), yet provision services that *exceed* current levels by over 10% for lines and 20% for usage. (*See* AT&T/WCom Ex. 14, Accompanying Workpapers at Attachment D-Demand Estimate.[129/]) The discrepancies between the MSM's cost estimates and the current costs of building an actual network are even more startling:

- The MSM hypothesizes that a brand new network could be deployed throughout Virginia with the minimal investment of approximately $505 per-line, even though CLECs invested approximately $3,000 per-line to develop their very real — but relatively new — networks across the country between 1997 and 2000. (VZ-VA Ex. 154; VZ-VA Ex. 108 at 6.)

- The MSM estimates that the total investment required to rebuild Verizon VA's entire network (assuming a 10% increase in demand) is only $2.9 billion. This is only $600 million more than Verizon VA spent on upgrades and expansions *over the past four years* (year-end 1996 to year-end 2000). (VZ-VA Ex. 154; VZ-VA Ex. 108 at 6.)

- The MSM produces expenses that are *less than one-third* of Verizon VA's current levels. For example, the MSM's estimates account for only 12% of Verizon VA's land and support asset expenses, 30% of Verizon VA's cable and wire expenses, 54% of its digital switching expenses, and 69% of its circuit equipment expenses. (VZ-VA Ex. 154; VZ-VA Ex. 108 at 6.)

[129/] According to these workpapers, the MSM submitted by AT&T/WorldCom assume a 21% increase from the year 2000 to the year 2002 for business, residence and special access ARMIS lines and a 19% usage increase from the year 2000 to the year 2002 for local, IntraLATA, and InterLATA NECA DEMs. As explained below, although Mr. Pitkin's line forecast is 6.2 million lines, the MSM ends up using only 5.7 million of these lines, which reduces the increase from year-2000 lines to about 10%.

Even assuming the technological advancements and efficiencies potentially associated with a forward-looking environment, there is absolutely no basis upon which to conclude that Verizon VA could rebuild its entire Virginia network for only a small fraction of its current cost. Nor is it plausible that the efficiencies achieved through competition will allow Verizon VA to operate its network by investing only 40% of the capital. In short, there is absolutely no evidence on the record to suggest that the costs associated with the MSM's hypothetical network accurately and reliably estimate the forward-looking, TELRIC costs of providing UNEs in Virginia. The MSM is so unreliable, so unsubstantiated, and so fundamentally flawed that this Commission should conclude that it may not properly be used to set rates for the provision of UNEs in Virginia.

A. The Synthesis Model from Which the Modified Synthesis Model Was Derived Cannot Produce Accurate and Reliable State- and Company-Specific UNE Cost Estimates.

The Synthesis Model, from which the Modified Synthesis Model is derived, was not designed, let alone approved, by the Commission to estimate state- and company-specific UNE cost estimates.[130/] In developing the Synthesis Model, the Commission specifically determined that it was not necessary for the federal universal service cost model to estimate the costs of a particular carrier.[131/] Indeed, as the Commission explained, by adopting the Synthesis Model, it was "not attempting to identify any particular company's cost of providing the supported

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130/ This is discussed throughout Verizon VA's written testimony, including VZ-VA Ex. 109 at 6-15.

131/ Tenth Report and Order, *In re Federal-State Joint Board on Universal Service, In re Forward-Looking Cost Mechanism for High Cost Support for Non-Rural LECs*, 14 FCC Rcd 20156, 20229 ¶ 162 (1999) ("*Tenth Report and Order*").

services."[132] Rather than engage in this time-consuming and burdensome, company, and jurisdiction-specific analysis in a nationwide proceeding, the Commission adopted a national proxy model, populated with nationwide input values, as an expedient. In doing so, the Commission acknowledged the obvious — that its model could not accurately estimate the costs (forward-looking, TELRIC-based, or otherwise) of a particular carrier in a particular state, and thus was not appropriate for estimating UNE costs.[133] Even AT&T/WorldCom witness Murray conceded that the universal service goals of the Synthesis Model require a different approach and a different level of accuracy than UNE costing: "[f]or purposes of universal service, it is not important to have as precise an attribution to specific cost-causing components of the network as is necessary in UNE pricing." (Tr. at 3204.)

As explained below, no amount of tinkering, or even wholesale modification, can remedy this fundamental model shortcoming; the Synthesis Model simply is not designed to produce accurate, company-specific, TELRIC cost estimates for all the UNEs that are the subject of this proceeding.

1. The MSM Is Incapable of Estimating the Cost of All the Network Elements That Verizon VA Must Provide.

One of the primary problems with using the Synthesis Model or the MSM to estimate UNE rates is that these models are unable to develop costs for all of the required network elements, including special access and high capacity services.[134] This inability reflects the

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[132] *Id.*

[133] *Id.* at 20172, 20229 ¶¶ 32, 162.

[134] As discussed below, this same flaw renders the MSM's Switching and Transport Module incapable of modeling transport costs for all but a few transport elements.

Synthesis Model's genesis as a universal service model: in the universal service context, where the range of service costs to be estimated is limited to plain old telephone service ("POTS") (Tr. at 4411 (Murphy)), there is simply no need to model network elements used to provide special access and high capacity services. With respect to UNE cost estimates, however, the ability to model these network elements is essential and, indeed, required by the Commission's rules.[135] (*See* VZ-VA Ex. 109 at 6, 10-15; Tr. at 4133-34 (Murphy).)

In developing the Synthesis Model, the Commission narrowly defined the network and services to be encompassed in federal universal service cost calculations, deliberately excluding non-supported services and, consequently, network elements not used to provide the supported services. As a result, the Synthesis Model is capable of producing cost estimates only for narrowly-defined loops that provide a limited range of services. In the UNE context, however, carriers must be able to provide a broad range of network elements, including, for example, DS1 and DS3 loops, dark fiber, and ISDN loops. The Synthesis Model and the MSM, by design, cannot account for all of the required facilities and equipment used to provide these network elements. Importantly, however, these are the very network elements for which cost estimates consistent with TELRIC must be estimated under the Commission's rules. As Mr. Murphy pointed out at the hearing:

> [W]e live in a digital world . . . . If we are going to build a forward-looking network via the TELRIC standard . . . the digital standard is the appropriate one to apply. . . . [However,] the model is simply not capable, not sophisticated enough, to handle the special access digital services that are being modeled.

(Tr. at 4133-34.)

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[135] *See* 47 C.F.R. § 51.505 (requiring prices that are based on TELRIC costs to be "calculated taking as a given the incumbent LEC's provision of other elements").

Because the goals of universal service differ significantly from those of the UNE costing process, and because the capabilities of the MSM are so limited, the MSM can only produce cost estimates for a small percentage of the UNEs for which prices are being set in this proceeding. (*See* Tr. at 5186-5200, 5555-62.) Accordingly, even Petitioners do not rely on the MSM for the vast majority of UNE costs they advocate. (AT&T/WCom Ex. 14 at 32.) Instead, AT&T/WorldCom base their cost proposals for most UNEs on a restatement of *Verizon VA's* cost studies or a non-TELRIC compliant method applied outside the MSM (*e.g.,* 4-wire, DS1 and DS3 loops). As discussed below, the changes made by AT&T/WorldCom in the MSM, though purportedly intended to enable the MSM to model some of these network elements, exacerbate this problem and substantially distort *all* of the MSM's UNE cost estimates.

2. The Synthesis Model Was Designed To Estimate The Relative Cost Differences Among Different States, Not the Forward-Looking Costs of Providing Network Elements in a Particular Jurisdiction.

Even with respect to the service costs that it was designed to model, the Synthesis Model was created with one purpose in mind — to estimate the *relative* cost differences for these services among different states. The Synthesis Model was never intended to estimate any carrier's costs (forward-looking or embedded) of operating a network in the real world or in Virginia in particular. In light of the Synthesis Model's limited design parameters, the Commission cautioned parties against using the Synthesis Model and its nationwide input values for any purpose other than federal universal service support.[136/] Specifically, the Commission stated:

> The federal cost model was developed for the purpose of determining federal universal service support, and *it may not be appropriate to use nationwide values*

136/ *Tenth Report and Order* at 20172 ¶¶ 31-32.

> *for other purposes, such as determining prices for unbundled network elements.* We caution parties from making any claims in other proceedings based upon the input values we adopt in this Order.[137/]

In fact, the Commission has repeatedly and unequivocally stated that the Synthesis Model should not be used for purposes other than determining *the relative cost differences among states.* Just recently, in rejecting CLEC arguments that the output of the Synthesis Model should be used to test whether UNE rates are TELRIC compliant, the Commission reiterated that:

> *The Commission has never used the USF cost model to determine rates for a particular element, nor was it designed to perform such a task.* The [Synthesis M]odel was designed to determine relative cost differences among different states, *not actual costs.* That is the purpose for which the Commission has used the [Synthesis M]odel in the universal service proceeding.[138/]

While the rough cost estimates of the Synthesis Model may be reasonable when the goal is approximating relative needs among the states for universal service funding, the Synthesis Model's cost estimates are wholly inappropriate for use in a UNE proceeding, where assessing the TELRIC costs of a specific company's forward-looking network is the ultimate goal.[139/] Indeed, generic, standardized inputs are a poor substitute for state- and carrier-specific data — especially where, as here, the incumbent has provided extensive, detailed data concerning the characteristics of its network and its own forward-looking costs of obtaining and installing the various components of that network. In short, there is no fathomable reason to substitute the

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137/ *Id.* at 20172, ¶ 32 (emphasis added).

138/ *Massachusetts § 271 Order* at 9003-04 ¶ 32 (emphasis added).

139/ The Commission has repeatedly recognized that the ability to estimate accurately the forward-looking costs of a particular carrier, in a particular state, is the crux of the UNE costing process under section 251. *Local Competition Order* at 15848-49 ¶ 685; *see also* FCC Reply Brief at 6.

MSM's generalized assumptions for the detailed, Verizon VA-specific data on the record in these proceedings.

B. AT&T/WorldCom's Modifications to the Synthesis Model Do Not Allow Their Model To Estimate Many UNE Costs Properly.

Even after Petitioners' extensive modifications and purported corrections to the Synthesis Model, their MSM still fails to produce reliable, forward-looking UNE cost estimates.[140/] To the contrary, AT&T/WorldCom's misguided attempt to compensate for the Synthesis Model's inability to model special access and high capacity services creates non-existent economies of scale and results in unjustifiably low UNE cost estimates. Their suggestion that the Synthesis Model can be readily converted into a UNE cost model with just a few input and algorithm changes is sheer folly — and is rendered even more suspect by the fact that the Commission already has rejected some of those changes as producing unreliable costs. Equally significant is the fact that, under the rate structure proposed by AT&T/WorldCom, Verizon VA would never be able to recover the full costs of the loops modeled by the MSM.[141/]

[140/] This is discussed throughout Verizon VA's written testimony, including VZ-VA Ex. 109 at 15-70 and VZ-VA Ex. 163 at 4.

[141/] Moreover, it makes little sense for this Commission to adopt or rely on a model written in a source code that the Commission has effectively abandoned. The source code for the "vast majority of the loop calculations" (Tr. at 4285) is written in Turbo Pascal, a software program that has been discontinued by Borland Software Company and is no longer commercially available in the United States. (Tr. at 4285.) This fact has restricted Verizon VA's ability to review and evaluate the MSM. Tellingly, the Commission's updated version of the Synthesis Model no longer uses the Turbo Pascal source code. (*See* http://www.fcc.gov/ccb/apd/hcpm/history.doc; Design History of HCPM, June 13, 2001 updates to new programming language, Delphi V.6.0.) "[I]n an effort to use a computer language that works best for the Commission and all interested parties," the Commission converted the Synthesis Model to the Delphi computer language. FCC Public Notice, DA-01-1458 (June 20, 2001).

Ultimately, the MSM is fundamentally, and incurably, unable to model a fully-functioning network. It is based upon faulty engineering standards and questionable design principles, and, as a result, omits critical network components. Paramount among the Model's shortcomings is its inability to model special access and high capacity services correctly. The MSM's failure even to provide for the basic equipment necessary for such services effectively guarantees that none of the DS3s or higher-speed special access services will function. (Tr. at 4398.) The MSM failings do not stop there. Even the drop wires modeled by the MSM are so "ridiculously short" that they would never be able to reach the customers' premises. (Tr. at 4398.)[142/]

Given the fundamental defects of the MSM, it should come as no surprise that AT&T/WorldCom have chosen not to sponsor the MSM in other ongoing UNE proceedings. Curiously, however, AT&T/WorldCom claim that the MSM is the "best available tool for estimating the TELRIC of providing UNEs for Verizon VA" (AT&T/WCom Ex. 14 at 14; Tr. at 4279), while simultaneously sponsoring a version of the HAI Model in an ongoing Massachusetts UNE proceeding and a reconstituted run of Verizon VA's cost model in the Washington, D.C. UNE proceeding. (Tr. at 4281-82.) The merits of each of these approaches aside, the ease with which AT&T/WorldCom switch from one cost model to another begs the question whether their proclamations here that the MSM is ideally suited to measuring TELRIC UNE costs have any value whatsoever.

[142/] As Mr. Murphy explained at the hearing, the MSM's incredibly short drop length of 23 feet per line is a mere fraction of the 73 feet per working line recommended by the Telcordia (Bellcore) study. (AT&T/WCom Ex. 122 at 12-8; Tr. at 4398.)

1. AT&T/WorldCom's Efforts to Account for Special Access and High Capacity Service Demand in the MSM Fail to Model Operational Services and Produce Artificial Economies of Scale That Understate Costs for All Loop UNEs.

AT&T/WorldCom improperly attempt to compensate for the MSM's inability to model special access and high-capacity services by using the MSM's simulated narrowband network to serve special access and high-capacity demand. In a real network, high-capacity services (*i.e.*, DS1 and DS3 services) must be provisioned over fiber optic cable or other high-speed facilities that extend all the way to the customer premises.[143/] The MSM, however, does not model any of the necessary, specialized types of facilities. Instead, AT&T/WorldCom converted special access and high capacity demand into DS0 equivalents to be served at existing business customer locations through the narrowband (*i.e.*, POTS) network simulated by the MSM. This has the effect of dramatically increasing the demand purportedly served by the narrowband network.[144/] (*See* VZ-VA Ex. 109 at 31.) Specifically, AT&T/WorldCom's unrealistic assumptions cause the MSM to build a separate loop for every access line and every special access DS0 equivalent. (Tr. at 4395 (Murphy); 4488 (Tardiff).) Thus, a DS1 special access line (which the MSM equates to 24 DS0 equivalents) is treated as 24 ordinary loops, even though it requires only two physical copper pairs or is provisioned on fiber (VZ-VA Ex. 109 at 31-32), and a DS3 special access line (which the MSM equates to 672 DS0 equivalents) is treated as 672 ordinary loops.[145/] (Tr. at 4395 (Murphy).)

[143/] Although DS1 service may be provisioned over two copper cable pairs, it is often provisioned over fiber within higher speed DS3 signals.

[144/] As Verizon VA witnesses Dr. Tardiff and Mr. Murphy demonstrated, AT&T/WorldCom's initial forecast of line counts was not only conceptually flawed, but was also the product of a misapplication of ARMIS reporting conventions. (VZ-VA Ex. 108 at 30-33; VZ-VA Ex. 109 at 30-31.) While AT&T/WorldCom attempted to remedy the latter error on surrebuttal (by reducing the number of special access lines by 700,000), they did nothing to