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		expenses associated with *retail* advertising; such costs must be excluded. Rebuttal Cost Panel at 93; Pitkin Surrebuttal, pp. 68-69. ***Forward-Looking Network Adjustment Factor ("FLC")*** — Verizon adjusts its projection of forward-looking expenses to make them equal to its current expenses, thus intentionally eliminating the reduction in expenses that would occur in a forward-looking network. Murray Rebuttal, pp. 35-36; Rebuttal Cost Panel, pp. 80-84. But a forward-looking network would reduce expenses in many ways; for example, fiber cable is much less expensive to maintain than copper cable. Rebuttal Cost Panel, pp. 82-84. The Synthesis Model, in contrast, conservatively estimates expenses. Pitkin Surrebuttal, pp. 62-71. ***EF& I*** – Verizon bases its engineer, furnish and install ("EF&I") costs on its recent experience installing materials. Verizon's method is particularly problematic with respect to DLC. Verizon calculates a ratio of equipment investment to material investment for plug-ins and hardwires and uses this factor to calculate plug-in EF&I. But if Verizon had calculated the ratio using plug-ins only, without hardwires, it would have revealed a much lower ratio. This is appropriate since plug-in installation is simple. Rebuttal Cost Panel, p. 75. ***Current-Cost-to-Book Cost Ratio*** – Verizon does not use a current-cost-to-book cost ("CC/BC") ratio to bring its embedded investments to 1999 levels before computing expense ratios. This is necessary because the investments to which the expense ratios are applied include the effects of inflation. Rebuttal Cost Panel, pp. 85-86.	Report and Order at ¶ 12. Moreover, the Modified Synthesis Model's outdated inputs consist of switches that are incapable of provisioning the requisite technology used to develop UNE costs. Murphy Rebuttal at 47-48. Moreover, the Modified Synthesis Model is incapable of accurately estimating state-specific or company-specific switching costs. The Modified Synthesis Model is based upon a model that was developed for universal service purposes, where a comparison of accurate loop costs – not switching costs – are critical. In a universal service environment, accurate switching costs are less of a concern. Fifth Report and Order at ¶ 75. Murphy Rebuttal at 48-49. ***Verizon VA Appropriately Used the Switch Discount That It Will Receive in the future:*** In its switching cost studies, Verizon VA used the discount that it will receive when deploying future switching equipment. This discount was calculated based on data from Verizon VA's recent switch purchases, as well as its current vendor contracts. Verizon VA assumed an appropriate mix of new and growth switch purchases, which accurately reflects Verizon VA's forward-looking mix of switch purchases. VZ-VA Recurring Panel Surrebuttal at 166-173. This methodology is appropriate because it develops the actual forward-looking discount, within the confines of TELRIC, that Verizon will receive, is based on the mix of equipment that Verizon is deploying in its network, captures all "credits" offered within the vendor contracts, is based on the prices Verizon will be paying for switching equipment, and is based on vendor-supplied data. VZ-VA Panel Direct at 190-194; VZ-VA Recurring Panel Surrebuttal at 167.

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		Rebuttal Cost Panel, pp. 85-86. ***Merger Efficiencies*** – Verizon fails to account for the savings it can expect from the Bell Atlantic/NYNEX merger and the later merger with GTE. Murray Rebuttal, pp. 37-38; Rebuttal Cost Panel at 87-88. **X. <u>ACCESS TO OSS</u>** One time development costs that are caused by a transition to a competitive environment should not be recovered from new entrants. New entrants themselves incur OSS costs in gearing up to do business and should not also have to pay the OSS costs on Verizon's side. Rebuttal Cost Panel, pp. 144-152 Moreover, CLECs certainly should not have to pay the full costs claimed by Verizon as these costs are not forward-looking. They include costs of developing multiple LSOG versions and different OSS for each of the Verizon regions, rather than the forward-looking costs of developing OSS across the Verizon footprint based on the most recent version of industry standards. *Id.*, pp. 154-59. Verizon also charges for the ongoing cost of maintaining and improving OSS. Verizon presumes this cost would be 15% of initial development costs. But Verizon has little support for this ratio, does not properly account for reductions in OSS computer costs over time, and, in any event, cannot reasonably apply this ratio to OSS development costs that are themselves inflated. Rebuttal Cost Panel, pp. 162-67. **XI. <u>DUF CHARGE</u>**	The discount that Verizon VA will receive when purchasing the latest available digital switching technology is appropriate for determining switching costs in this proceeding and has been endorsed by the Commission in the SBC Oklahoma/Kansas 271 proceeding. Direct Panel at 189-190. Furthermore, using the most recent year's switch purchases is predictive of what Verizon VA will experience in future years. The 2000 data represent a very large sample size and is predictive of Verizon VA's future switch purchasing plans. VZ-VA Recurring Panel Surrebuttal at 170-172. The Modified Synthesis Model, by contrast, cannot reflect a carrier's actual switch discounts, or identify a carrier's actual switch mix. The Modified Synthesis Model cannot distinguish between the types of switches a carrier actually uses in its network (e.g., Lucent versus Nortel), and thus cannot reflect the actual discounts a carrier receives with respect to that network. Murphy Rebuttal at 47-48. Moreover, the Modified Synthesis Model's switch inputs do not account for switch growth jobs or upgrades Tenth Report and Order, Appendix C ¶ 2 — a model flaw that ignores the switch engineering practices used to construct a real-world telephone network. By eliminating switch growth jobs and upgrades, the Modified Synthesis Model is incapable of reflecting the actual growth experienced by real-world networks and ignores the fact that Verizon's true forward-looking costs will consist primarily of growth additions and upgrades. The Model simply assumes away these higher per-line costs. Murphy Rebuttal at 90-91. The assumption that there are never any growth switches

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		Verizon Daily Usage File ("DUF") charge is six times higher than the current price and far higher than the charge in other states. It is incorrect for a number of reasons and, in any event, Verizon likely already includes these costs in its expense loading factors. Rebuttal Cost Panel, pp. 168-71.	or upgrades is also inconsistent with a number of the Model's other input assumptions. If Verizon installed only new switches, with no plans to purchase additional capacity — a completely absurd assumption — Verizon's switches would need considerably more capacity than is assumed by the Modified Synthesis Model. In addition, the depreciation for switches would have to be much higher because the life of the switch would be substantially shorter than that assumed by the Modified Synthesis Model. The Model, however, conveniently ignores the requisite cost of capital and shorter depreciation lives because their inclusion would noticeably increase the cost estimates produced by the Model. ***Use of SCIS:*** AT&T/WorldCom's claim that SCIS models only new switches is incorrect. The SCIS model can be used to develop both growth or replacement costs, and a combination of the two. The rules provided by switch vendors to Telcordia, the developer of SCIS, are applicable to both installation of new switching systems and growth of existing switches. Regardless of whether a new switch or growth of an existing switch is modeled, SCIS addresses the latest technical/engineering parameters. The user, such as Verizon VA, inputs its latest contract specifics. Garfield Surrebuttal at 3-4; VZ-VA Recurring Panel Surrebuttal at 173-179. Verizon VA appropriately applied the appropriate discount, which reflects new and growth switch purchases, to all switching investments. Contrary to AT&T/WorldCom's claims, Verizon VA does not always receive a new switch discount for certain purchases, such as "getting started" costs. Rather, Verizon VA routinely upgrades and grows switches by replacing components such as switch processors and receives a growth

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			discount for these purchases. Indeed, over the long run, Verizon VA replaces virtually all parts of the switch and does not receive a new switch discount when these components are purchased. These upgrades are often dictated by the vendors themselves. VZ-VA Recurring Panel Surrebuttal at 175-179. ***Verizon VA Is Not Required To Assume Only New Switch Purchases:*** A forward-looking study guided by TELRIC principles does not, contrary to AT&T/WorldCom's contention, require Verizon VA to assume the purchase of only new switches. VZ-VA Panel Direct at 188-190; VZ-VA Recurring Panel Surrebuttal at 167-168; *see also* Shelanski Direct at 24-25; Gordon Direct at 22-23; Tardiff Rebuttal at 48; Gordon Direct at 5. Even if AT&T/WorldCom's instantaneous new switch replacement theory were adopted, it is highly unlikely that Verizon VA would be able to replace its entire switch network at one time and receive the current new switch discounts. Rather, in this scenario, it is likely that vendors would increase switch prices to account for increased demand and decreasing supply of switches. VZ-VA Recurring Panel Surrebuttal at 168-169. ***Verizon VA Assumed an Appropriate Technology Mix and GR-303 Line Concentration Ratio:*** Verizon VA assumes an appropriate forward-looking technology mix in its switching cost studies, based on current growth trends. Verizon VA assumed an all digital switching network. Between the three types of switching technology in Verizon VA's network, Verizon VA assumes an access line split of 86% 5ESS (Lucent type), 3.65% DMS-100 (Nortel type), and 10.35% EWSD (Siemens type), to ensure strategic diversity in the sources of supply for this important network asset. VZ-VA Panel Direct at

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			183-184. Verizon VA cost study assumes 10% GR-303 IDLC, even though Verizon VA has virtually no lines integrated using GR-303 technology. Verizon VA also generously assumes 47.6% TR-008 IDLC technology; only 23% of Verizon VA's access lines currently are integrated using TR-008 technology. These assumptions are generous, since Verizon VA is now buying exclusively TR-008 equipment and has no plans to install GR-303 in its network. In addition, in the entire Verizon East footprint, GR-303 has been deployed only on a limited trial application basis. As a result, only 0.07 percent of the total working loops in Verizon East are being served via GR-303 technology. VZ-VA Recurring Panel Surrebuttal at 180-182. Drastically higher IDLC assumptions, such as the 82% GR-303 assumption proposed by AT&T/WorldCom, are unrealistic and ignore that Verizon VA's switching network is directly tied to the design of the outside plant loops. Verizon VA properly assumed a line concentration of 3:1 at the remote terminal of GR-303 DLC. This proposed ratio is based on the experience and judgment of Verizon VA's network engineers. Since IDLC remote terminals are likely to serve higher usage business customers, Verizon VA considers 3:1 line concentration reasonable. If this ratio is arbitrarily set higher than 3:1, Verizon VA's higher usage customers could experience blocking (e.g., a busy signal). AT&T/WorldCom have offered no evidence to support their proposed 4:1 line concentration ratio. VZ-VA Recurring Panel Surrebuttal at 183-185; VZ-VA Panel Direct at 183. The Modified Synthesis Model, on the other hand, fails

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			to adhere to standard switch engineering principles, thereby creating a network on which customers would frequently be denied service. The Model does not recognize, and thus is ill-equipped to handle, the busy seasons and busy hours that drive the configuration of real-world central offices and their associated trunking network. Ignoring the actual operating conditions of existing switches, as well as well-established engineering standards, the Model inappropriately assumes that a fixed amount of traffic is spread evenly over 270 business days, and that 10 percent of this average occurs during the busy hour. Such simplistic assumptions cause the Model to produce switches that are incapable of handling the higher traffic loads experienced during peak traffic periods, and create a network on which customers will frequently be denied service. Murphy Rebuttal at 50-52. ***Verizon's Utilization Rate Is Supported and Verizon VA Has Explained Its Process of Implementing This Rate in Its Cost Studies:*** Verizon VA appropriately accounts for utilization in both SCIS and VCost, by entering a higher than actual utilization percentage in SCIS and then adjusting that down in VCost. This is necessary for Verizon VA to accurately account for Verizon VA's utilization assumptions. Setting utilization at 1.0 in VCost, as AT&T/WorldCom propose, would understate costs. VZ-VA Recurring Panel Surrebuttal at 186-188; VZ-VA Panel Direct at 194-196. Verizon VA also properly adjusted its utilization factors to account for SCIS administrative fills and breakage. VZ-VA Panel Direct at 196-197; VZ-VA Recurring Panel Surrebuttal at 186-88. ***Verizon VA's Proposed Costs for Features Are Well-Supported:*** Verizon VA has supported its proposed feature

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			costs, and has appropriately applied a mix of growth and replacement discounts for feature costs. Verizon VA's estimates regarding feature usage fully are based on the judgment of the product manager, who has over 25 years of experience. AT&T/WorldCom have offered no evidence that Verizon VA's feature inputs do not represent appropriate feature usage, even though they both own switches and presumably keep track of their own feature usage information for internal purposes. VZ-VA Recurring Panel Surrebuttal at 188-191. ***Verizon VA Appropriately Allocated Its Switching Costs Based on Traffic v. Non-Traffic Sensitive Costs:*** Verizon VA has correctly identified switching costs as traffic-sensitive or non-traffic-sensitive. AT&T/WorldCom misidentify usage-driven costs in an attempt to shift most of the switching costs to the port rate element. As Mr. West explains, under this rate structure, the smaller CLECs that serve low volume residential customers would be subsidizing the larger CLECs (like AT&T/WorldCom) that serve high volume business customers. *See* West Direct at 5. AT&T/WorldCom's proposal that Verizon VA offer two different rate structures would be unworkable and causes Verizon VA to under-recover its costs. West Rebuttal at 8-10; Shelanski Rebuttal at 26-28. The question to ask when assigning costs between usage and the port is: What switch resources are dedicated to one user, and what resources are shared among all users? Dedicated resources should be recovered by the particular user dedicated to that resource, while shared resources should be recovered by each user sharing those resources in a fair and reasonable manner. Verizon VA utilized SCIS to ensure that investments are accurately and appropriately allocated. VZ-VA Recurring

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			Panel Surrebuttal at 191-193. Contrary to AT&T/WorldCom's claims, "getting started" and EPHC costs should be considered traffic-sensitive. Although switch capacity is limited in part by ports, usage is by far the predominant driver in determining "getting started" and EPHC costs. This assumption is consistent with evolving switch technology. Garfield Surrebuttal at 6-14. For these same reasons, the Modified Synthesis Model significantly overestimates the non-traffic sensitive components of a switch. The *only* non-traffic portion of the switch is the initial equipment stage of the line termination -- this component is dedicated to a single subscriber and is never used for any purpose other than communicating with that one subscriber. All other features of the switch are shared among all users and impact call processing times, and are thus appropriately classified as traffic sensitive. The Modified Synthesis Model's assumption that 23% of the switch is traffic sensitive completely ignores the fact that switching functions and components such as local number portability, call waiting, caller ID, the switching matrix, trunks, switch memory and processors, and engineered port capacity -- to name just a few -- are all sensitive to the amount of traffic generated by the users of the switch. The Model's use of this 23% value cuts the cost estimate for local usage nearly in half and doubles the cost of switch port functionality, thereby driving up prices for residence and business customers with lower usage. Murphy Rebuttal at 52-56. ***Verizon VA Seeks To Recover Reasonable, Forward-Looking RTU Fees:*** Verizon VA has proposed reasonable,

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			forward-looking right-to-use (RTU) fees and has fully documented these costs. Software expenditures can and do vary greatly year to year. VZ-VA Recurring Panel Surrebuttal at 197-198. Verizon VA's switching vendors issue new releases of software on a yearly basis. Each release contains new software features and operational/maintenance packages, requiring modifications to existing switches. AT&T/WorldCom's claim that Verizon VA's RTU fees improperly include costs to update older switches is without merit. VZ-VA Recurring Panel Surrebuttal at 199-200. ***Verizon VA's Proposed Switch EF&I Factor Is Developed from Reliable and Recent Data:*** Verizon VA's switching EF&I factor is developed from Verizon's DCPR data, which reflects, among other things, the costs to install switching equipment throughout the Verizon footprint in 1998. This factor estimates the cost to install digital switching equipment based on the relationship between material investments and installation costs that existed in 1998. Using the EF&I factor that AT&T/WorldCom propose, which is based on information from 1992, is inappropriate because it reflects the network architecture in place in 1991-1992, the discounts available to Virginia during this time, and the outdated mix of technology and other considerations. VZ-VA Recurring Panel Surrebuttal at 202-204.

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			VIII. <u>OUTSIDE PLANT COST STUDIES AND NETWORK ARCHITECTURE INPUTS</u> ***Verizon's Model Accurately Estimates Real World, Forward-looking Loop Costs:*** Verizon's studies produce the reasonable, appropriate costs of local loops in an efficient, forward-looking network based on reliable, testable data and reasonable engineering assumptions about forward-looking developments and technology. The costs of two- and four-wire analog loops; off-premise extension unbundled loops; ISDN/BRI (two-wire digital loops); digital four-wire (56 and 64 Kbps) loops; two- and four-wire customer-specified signaling loops; and DS1/ISDN PRI loops are all analyzed in the same manner, and AT&T/WorldCom raise no questions specific to any particular type of loop. VZ-VA Panel Direct at 78-178; VZ-VA Recurring Panel Surrebuttal at 59-148. AT&T/WorldCom's general attacks on Verizon's loop costs are addressed below. ***The Modified Synthesis Model Cannot Accurately Study Loop Costs:*** The Modified Synthesis Model is incapable of accurately determining the costs for all components of the loop as defined by the Commission (e.g., fiber loops, distribution subloop, and feeder subloop), thereby significantly understating and distorting the cost estimates produced. This understatement is exacerbated by the fact that the Model produces a loop that is unable to support the wide-range of services required to meet the needs of customers, including dark fiber, ISDN, DDS, DS1, and DS3. Murphy Rebuttal at 6-7; 16-38 Moreover, the Model produces approximately 50% of the distribution serving areas that actually exist in Verizon's

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			network, uses unrealistically large serving areas, and thus does not optimize the length of the feeder portion of the loop. The Model it incorrectly models access to unbundled, fiber-fed loops using the GR-303 IDLC switch interface, ignoring current technological limitations and the costs of resolving them. Combined with the Model's other flawed inputs (i.e., overstated demand, unattainably high utilization factors, low structure costs, and too little length of cable) the Model produces an unattainably low estimate of the cost of provisioning adequate loop plant. The Modified Synthesis Model estimates a statewide average loop cost for Virginia of $5.92 – a mere fraction of what any efficient carrier would incur to provide the unbundled loop. This is less than one-third of the estimate produced by the Synthesis Model, and is 56 percent less than the cost estimate filed by AT&T/WorldCom in Virginia just four years ago. In addition, the Modified Synthesis Model does not accurately depict service demand, which is essential to the development of TELRIC-compliant loop cost estimates. AT&T/WorldCom use inappropriate forecasts of Verizon VA's 2002 ARMIS data, which includes vintage data that should be excluded and reflects growth rates that are outdated. Loop cost estimates are further understated as a result of unrealistic efficiencies derived from extraordinarily inflated and unjustified estimates of special access line growth. AT&T/WorldCom have tried to pick and chose line count data from varying vintages and locations to produce unrealistically low cost estimates. Murphy Rebuttal at 29-31. Moreover, the Modified Synthesis Model is incapable of

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			accurately modeling special access services. The Model improperly assumes that all DS1 and DS3 services reported as special access lines in ARMIS (as equivalent DS0 line counts) are provisioned on individual physical loops, even though DS3 services can only be provisioned over coaxial or fiber optic cable and DS1 services are either contained within higher speed DS3 signals or provisioned over just 2 physical loops. Notably, the Modified Synthesis Model does not build any fiber or coaxial loops that terminate at any customer locations. By itself, the use of DS0 equivalents, as reported in ARMIS, somewhat overstates the amount of loop plant in the Modified Synthesis Model, but because of the Model's grossly inflated count of physical copper loops, it significantly understates the cost of the two-wire copper loop typically used to provision basic local exchange service. When spread across all business customer locations rather than the actual termination points of the services, the inefficiencies associated with the larger but improperly distributed loop plant and non-existent economies of scale substantially drive down the loop investment. Murphy Rebuttal at 29-31. In addition, the Modified Synthesis Model does not include the investment for the electronic multiplexing equipment that enables special access DS1 services to function over copper cable, thereby omitting the necessary functionality to deliver DS1 or higher speed services and further understating the estimated loop costs. Murphy Rebuttal at 29-38. Moreover, the Modified Synthesis Model's node selection criteria effectively eliminate most of the flexibility contained in the original Synthesis Model. AT&T/WorldCom reject average cost basis (modified PRIM algorithm) for

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			connecting nodes to the central office -- the criteria used in the original Synthesis Model -- and in its place use distance (original PRIM algorithm) as the means by which nodes are connected. As a result, the Modified Synthesis Model ignores all the other OSP input values and code changes that are relevant to Commission's node selection criteria and, predictably, significantly understates the cost of the loop. ***AT&T/WorldCom's Four-Wire Loops Costs Are Flawed:*** Because the Modified Synthesis Model does not calculate the costs of provisioning four-wire loops, AT&T/WorldCom calculate those costs outside the Model. They inappropriately assume that each of the components (NID, Concentration, Feeder and Distribution) that make up a two-wire DLC and non-DLC loop are accurate and require only minor adjustments to develop a four-wire cost. Ignoring the complex differences between two-wire and four-wire loops, AT&T/WorldCom simply increase two-wire component usage and costs by a fixed amount to arrive at a four-wire cost estimate, and erroneously assume that all line types consume the same portion of each element, thereby understating the costs of a four-wire loop. AT&T/WorldCom fail to account for the concentration function inherent in the assumed GR-303 IDLC in their development of a four-wire loop cost estimate. The Model makes no adjustment for the additional DLC common equipment required by four-wire circuits and mistakenly assumes they can be concentrated in the same fashion as two-wire POTS lines. Unlike two-wire loops which are assigned a quarter of the cost (assuming a concentration ration of 4:1) of a DS0 due to the concentration feature, four-wire loops cannot be

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			concentrated because they are generally "full period" loops, requiring a dedicated transmission path. Murphy Rebuttal at 40-41. AT&T/WorldCom also fail to capture additional common equipment allocations that should be made. For example, a given number of four-wire circuits will require from 2 to 4 times as many channel units, and therefore from 2 to 4 times as many plug-in slots, shelf space and cabinet space, as a two-wire POTS line. AT&T/WorldCom, however, do not include the component common equipment cost allocation per circuit for a four-wire circuit which is 2 to 4 times higher than a POTS line card. Murphy Rebuttal at 1. ***AT&T/WorldCom's Proposed DS1 Loop Costs Are Understated:*** AT&T/WorldCom's estimates for DS1 loop costs do not account for any of the physical equipment components necessary to provision DS1 services and assume, inappropriately, that 90% of the special access services are DS1s. AT&T/WorldCom then apply a 1994 nationwide, non-cost based, price benchmark to this percentage, and produce a two-wire cost multiplier to develop DS1 costs, which surprisingly ignores the DS0 equivalent demand used in the Synthesis Model based on 12 DS0 equivalents per line. Murphy Rebuttal at 42-44. ***Verizon's Loop Rate Deaveraging***. Verizon deaverages its loop costs into three different density zones as required under the Commission's TELRIC regulations, 47 C.F.R. § 51.507(f); such deaveraging applies to loop and certain subloop elements. The deaveraging proposed by Verizon VA has not been opposed

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			by AT&T/WorldCom. VZ-VA Panel Direct at 76-77. In contrast, the Modified Synthesis Model proposes a four-wire loop cost and a DS1 loop cost that are statewide averages rather than deaveraged by density zone. This statewide average is inconsistent with the Commission's geographic deaveraging requirements and Verizon's presentation of its four-wire and DS1 loop costs. Murphy Rebuttal at 38-42. ***Verizon's Use of Existing Routes, Structure, and Distribution Areas Produces A Reliable, Verifiable, and Forward-looking Network Construct:*** Verizon's use of the 1993-1995 engineering survey to study loop routes and structure is entirely appropriate given that these network attributes are largely static and thus unlikely to change in a forward-looking environment. Among other things, the current routes and structure reflect efficient choices taking into account geography, actual customer locations, and local government requirements; while replacement of the existing network routes and structure would be enormously expensive and inefficient, producing entirely unpredictable costs related to new, higher right-of-way fees, buried cable requirements, and rerouting as a result of regulatory protections for environmental and historic preservation reasons. Given that "scorched-node" rerouting would be an entirely hypothetical, unmanageable exercise, route data from Verizon VA's existing network represents the most reliable route data for these proceedings. Use of this route data also is entirely consistent with the modeling of a forward-looking network, because these fundamental elements of "existing network design" will continue to exist well into the future. (Reply Brief for Petitioners United States and the Federal Communication Commission, Verizon Communications

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			Inc. v. Federal Communications Commission, No. 00-511, at 4-5 (July 23, 2001) ("FCC Reply Brief"); Local Competition Order ¶ 685.) VZ-VA Recurring Panel Surrebuttal at 60-71. In addition, the route data from Verizon's engineering survey is reliable, as was the process used to collect such data. VZ-VA Recurring Panel Surrebuttal at 67-71. Verizon VA's use of existing distribution areas (DAs) in its studies is appropriate and does not result in an understatement of costs, a decrease in fill factors (which are unaffected by the DA assumptions), or the recovery of embedded costs. Nor is it inappropriate to use existing DAs and line counts and the engineering survey data with respect to loop routes, given that the loop route data have remained largely unchanged. VZ-VA Recurring Panel Surrebuttal at 71-74. ***The Modified Synthesis Model's Newly Constructed Network Uses Flawed Engineering Assumptions and Would be Incapable of Serving Virginia Customers:*** The Modified Synthesis Model attempts to build an entire network from scratch using surrogate customer locations that are based on proprietary road surrogate data assembled by TNS (formerly PNR Associates). No party, including Verizon, state commissions, or Verizon's consultants, has been allowed sufficient access to meaningfully review the actual data or the processes TNS uses to convert the data into customer locations. The Modified Synthesis Model also uses flawed engineering standards and assumptions. For example, because the Model builds an average drop length of only 24 feet, numerous housing units and business locations will not get

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			physically connected to the network. The Model's 24-foot average drop length is significantly shorter than the average drop lengths advocated by AT&T in other proceedings. (Before the Commonwealth of Massachusetts Department of Telecommunications and Energy, D.T.E. 01-20, *Direct Testimony of Robert A. Mercer* (May 8, 2001) at Exhibit 3, p. 15.) The Modified Synthesis Model also does not adhere to Carrier Serving Area ("CSA") loop design standards, which limit the use of copper loops to 12,000 feet beyond the feeder/distribution interface. By ignoring the CSA standard, the Model designs loop plant that may be incapable of supporting many services currently offered over basic loops (i.e., a modem speed greater than 28.8 kbs, ISDN, DDS) and introduces inefficiencies in ILEC provisioning processes. Murphy Rebuttal at 19-46. The Modified Synthesis Model does not build OSP to residential and business units that are vacant pending rental turnover or real estate transfer or known new construction sites. As a result, the Model could not possibly meet the service quality standards mandated by the Virginia Commission for the provision of residential and business services. Murphy Rebuttal at 19-25. The Model also substantially underestimates the amount of distribution cable. The overall distribution lengths produced are well below widely-accepted industry standards, and in some instances, are less than the *minimum* distance between the central office and the customer being connected. These understated distribution cable lengths impact many outputs beyond the investment cost of the distribution cable itself – support structures (e.g., poles, manholes, trenches, conduits, pull

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			boxes), maintenance costs, and many other factors are affected by the layout and length of the distribution network. Moreover, AT&T/WorldCom improperly adjust the distribution road factor downward from 1.0 to 0.9, further reducing distribution cable. This reduction is not based on an empirical study as recommended by the Commission, but rather is based on an order of the Kansas Public Service Commission, which contains a relationship of modeled sheath feet to actual sheath feet that is exactly the opposite of Verizon VA's experience in its real-world operations. Murphy Rebuttal at 6-7; 85-86; Tardiff Rebuttal at 48-49. The Modified Synthesis Model's failure to provide sufficient distribution facilities is magnified by the Model's failure to adhere to engineering standards that call for maximizing the length of feeder facilities in the local loop. This combination of an inefficiently small amount of feeder facilities and an impossibly small amount of distribution facilities substantially understates the loop investments necessary to serve Verizon customers. Murphy Rebuttal at 85-87. The Model also fails to represent accurately the area that is being modeled, identify line counts within that area, establish existing customer locations, or accurately size serving areas. The Modified Synthesis Model, as a result of its inefficient and inappropriate OSP design, models a network in which 27 percent of the serving areas exceed 600 living units, thus violating economic and widely-accepted engineering practices, and producing results that bear no relationship to the network operations of any efficient, real-world carrier. Murphy Rebuttal at 27-29.

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			Verizon VA's Loop Cost Studies Use Appropriate, Forward-Looking Assumptions About the Use of Copper Versus Fiber Feeder Facilities: Verizon VA's loop cost studies appropriately assume that, in a forward-looking network, copper feeder will be used only on shorter feeder routes and fiber facilities would be used on longer feeder routes and on shorter routes that serve large numbers of customers in the same building. Verizon VA performed a breakpoint analysis to determine that, on feeder routes extending beyond 4,000 feet, it is more cost-effective to use fiber facilities. AT&T/WorldCom have not presented any criticisms of the manner in which Verizon VA calculated the copper-fiber breakpoint. VZ-VA Panel Direct at 94-98. ***The Modified Synthesis Model Improperly Assigns Feeder Routes To Be Served by Copper When They Should Be Served by Fiber, and Vice Versa:*** The Modified Synthesis Model improperly assigns the feeder cable type on certain feeder routes. This is particularly problematic because the Model is used in the UNE context to disaggregate loop costs by density zone and type of feeder (DLC versus non-DLC). For the feeder type disaggregation, the misassignment of costs renders the disaggregated feeder averages essentially meaningless. The average (over DLC and non-DLC) loop costs within a density class are also suspect, because their validity depends on the unlikely assumption that overall average feeder investment per line-foot is uniform throughout the wire center. Tardiff Rebuttal at 10-11. ***Verizon's IDLC versus UDLC and GR-303 Assumptions Are Appropriate Given Existing, Efficient Technology and Service Needs:*** Verizon VA's assumptions

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			regarding deployment of digital loop carrier systems – including its assumptions about deployment of IDLC versus UDLC and GR-303 versus TR-008, and its assumptions about the GR-303 line concentration ratio – are realistic, forward-looking and the most sensible assumptions for these cost studies. There is no dispute that Verizon VA's assumptions regarding the make-up of the forward-looking network include far more IDLC penetration than Verizon VA is likely to achieve in the foreseeable future. For purposes of the recurring cost study, Verizon VA assumes a network with 82.3% of the loops being fiber-fed DLC, of which 73.5% are IDLC. Verizon VA must continue to deploy UDLC because it is essential for providing certain services, including unswitched services and unbundled loops. Verizon VA's assumed level of IDLC deployment is very aggressive, and far exceeds Verizon VA's current network makeup or the levels that will result from Verizon's planned deployment during the planning period. The same is true with respect to GR-303 assumptions: while there is currently *no* GR-303 in Verizon VA's network, Verizon VA's loop cost studies assume the cost savings associated with 10% GR-303 penetration in the forward-looking network and do not include substantial additional costs that Verizon VA would have to incur (such as for new OSS) to deploy GR-303. It is not reasonable to assume even higher percentages of IDLC (and more GR-303 in particular) based on hypothetical features and technologies that might eliminate the need for UDLC but do not yet exist. Industry standards and technical interfaces still need to be developed to support using GR-303 in a multi-carrier environment. Remote terminal ("RT") suppliers would also have to develop additional security, error-detection, and other capabilities necessary to support the use of the same RT and central office terminal ("COT") by multiple carriers. These

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			capabilities have not yet been developed. To nonetheless assume IDLC/GR-303 loop unbundling would violate the principle that TELRIC studies must assess the costs of "equipment that is commercially available today -- equipment that carriers are already using to upgrade and expand their networks." FCC Reply Brief at 61; First Report and Order ¶ 685. Moreover, these features and technologies would have their own associated costs that have never been studied or considered. VZ-VA Panel Direct at 89-92; VZ-VA Recurring Panel Surrebuttal at 76-85. ***The Modified Synthesis Model Erroneously Assumes IDLC Loop Unbundling:*** The Modified Synthesis Model provisions all fiber-fed DLC loops utilizing the GR-303 IDLC switch interface; however, it is not technically feasible or cost-effective to provide access to unbundled loops served with the GR-303 IDLC interface. Apart from the technical problems associated with IDLC unbundling, the Modified Synthesis Model does not determine all appropriate costs that would be incurred by Verizon to unbundle GR-303 loops. Murphy Rebuttal at pp. 26-27. ***Verizon VA's Model Accurately Estimates Cable, Conduit and Pole Costs:*** Verizon's VRUC database provides the most accurate available data concerning the installed investment for copper feeder and distribution cable in Virginia. The underlying data, as updated by Verizon VA in this proceeding, are valid and do not overstate those costs. Contrary to AT&T/WorldCom's contentions, year-to-year changes in VRUC prices primarily reflect peculiarities of the Commission's accounting rules and differences in the types of installation projects undertaken from year to year, rather than inflation (or

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			deflation) in the across-the-board cost of installing copper cable. These year-to-year fluctuations in no way indicate any unreliability in the VRUC data, and Verizon's use of a regression analysis minimizes the effect of such fluctuations on the loop cost studies. AT&T/WorldCom's proposed remedy for these fluctuations – using the VRUC data from the single year with the lowest costs – produces a substantial understatement of Verizon VA's forward-looking cable investment. VZ-VA Recurring Panel Surrebuttal at 85-97, 101-102. Verizon's studies likely understate rather than overstate cable costs by using the per-unit costs of larger feeder and distribution cables than would be used in the actual network. These per-unit costs are lower than the per-unit costs of cables that actually would be used in a forward-looking network, thereby providing AT&T/WorldCom with the advantage of understated loop UNE costs. VZ-VA Recurring Panel Surrebuttal at 97-101. As with VRUC data, the year-to-year fluctuations in Verizon VA's cost of installing conduit primarily reflect differences in the types of projects undertaken from year to year, as well as peculiarities in the Commission's accounting rules. It is therefore inappropriate to use data from only the single year with the lowest installed conduit costs. VZ-VA Recurring Panel Surrebuttal at 101-102. Verizon's pole costs are far more appropriate than AT&T/WorldCom's proposed "scorched-node" approach of instantaneously building an entire network, which necessarily would involve astronomical costs resulting from huge, short-term demand for labor and materials that far exceeds supply, as

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			well as higher rights-of-way fees. VZ-VA Recurring Panel Surrebuttal at 102-104. ***The Modified Synthesis Model Produces Grossly Understated Cable and Structure Costs:*** In general, the investment required to reconstruct Verizon's outside plant ("OSP") facilities is several times higher than what the Modified Synthesis Model produces. The Model's understated costs can be explained by the Model's use of insufficient material (e.g., cable and structures) to provide service, the Model's unrealistically low prices for materials, and the Model's unrealistic assumption that OSP costs decrease over time. The Modified Synthesis Model includes numerous other errors and oversights (e.g., failing to consider on a location-by-location basis factors such as existing structure, governmental policies, local weather, potential roadside hazards, and possible rodent damage) that affect structure costs. Murphy Rebuttal at 106-109. ***Verizon's Structure Costs and Sharing Calculations Are Reasonable and Realistic:*** Verizon VA's studies appropriately account for per-unit structure costs. The existing investment data used in these studies also accounts for the limited structure sharing opportunities that are available to Verizon VA. Where Verizon has shared the cost of digging a trench with another carrier or utility, Verizon VA's accounting data reflect only the costs incurred by Verizon VA for the trench. Likewise, Verizon VA's structure investment data are adjusted to account for revenues from pole attachments and leasing conduit. Thus, the investment data used by Verizon VA for the loop cost studies already reflect achievable cost savings from structure sharing, and it is unnecessary and inappropriate to

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			make a further adjustment to reflect structure sharing among multiple carriers. VZ-VA Panel Direct at 118-119; VZ-VA Recurring Panel Surrebuttal at 145-147. ***The Modified Synthesis Model Makes Irrational Structure Sharing Assumptions:*** The Modified Synthesis Model capitalizes on the cost-savings associated with structure sharing without taking into account the costs of the investment in structure necessary to accommodate other utilities and the costs of building structures that reflect the operating realities in Virginia. The Model also exaggerates the cost-savings associated with certain types of structure sharing by assuming unrealistic opportunities for sharing of structure. Moreover, AT&T/WorldCom's cost-reducing adjustments to the Synthesis Model's nationwide average default values for structure sharing are unsubstantiated, and by making them to the Synthesis Model's code as opposed to the default input values, AT&T/WorldCom introduce a cost-reducing bias into the Model logic. Murphy Rebuttal at 93-101. The resulting flaws are compounded by the fact that national structure sharing values are used. By doing so, the Model ignores the fact that TELRIC-compliant costs for UNEs must be based on the sharing opportunities that Verizon and other efficient providers experience in Virginia. Murphy Rebuttal at 93-101. ***Verizon VA's Proposed Utilization Rates Are Based on Sound Engineering and Costing Principles and Are Forward-looking:*** Verizon VA's proposed utilization rates for components of the local loop represent the best measure of expected utilization rates in an efficient, forward-looking

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			network. These rates reflect the use of sound engineering principles to achieve the most efficient network design, as well as constraints from regulatory service obligations imposed by the Commonwealth of Virginia. These rates account for the need to maintain sufficient margins of spare capacity for administration, maintenance, and demand growth, as well as the real-world impact of churn, demand fluctuations, and breakage on utilization. In general, the rates proposed by Verizon VA are its current rates of utilization in the Virginia network. Based on the experience and judgment of Verizon engineers, Verizon VA determined that these rates, which have been stable in Verizon VA's network for years, would remain the same in a forward-looking network. Verizon VA's existing utilization rates are **[VERIZON PROPRIETARY BEGINS]** __% **[VERIZON PROPRIETARY ENDS]** for distribution cable, **[VERIZON PROPRIETARY BEGINS]** __% **[VERIZON PROPRIETARY ENDS]** for copper feeder cable,**[VERIZON PROPRIETARY BEGINS]** __% **[VERIZON PROPRIETARY ENDS]**for RT common equipment, **[VERIZON PROPRIETARY BEGINS]** __% **[VERIZON PROPRIETARY ENDS]** for fiber strand, and **[VERIZON PROPRIETARY BEGINS]** __ % **[VERIZON PROPRIETARY ENDS]**for conduit. Verizon determined that, for RT service plug-ins (also called channel units), it was more appropriate to use an **[VERIZON PROPRIETARY BEGINS]** __% **[VERIZON PROPRIETARY ENDS]** utilization rate instead of Verizon's lower actual utilization rate. In contrast, AT&T/WorldCom's proposed utilization rates fail to provide sufficient spare margins for administration, maintenance, and demand growth, and fail to account for the effects of churn, breakage, and demand fluctuations. This would produce a network far more costly (and in some cases, impossible) to

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			operate without substantially compromising service quality. Moreover, because spare capacity represents a current cost, it is appropriate to require current ratepayers to pay for the cost of existing spare capacity. And AT&T/WorldCom's argument that Verizon should have used certain engineering assumptions regarding which lines are "working" for calculation of its utilization rates ignores AT&T/WorldCom's own principle that the key utilization issue in a cost study is how to spread costs among units of plant available to generate revenue. VZ-VA Panel Direct at 100-116; VZ-VA Recurring Panel at 104-147. ***Distribution Utilization:*** Verizon has shown that while its distribution utilization factor is designed to account for a reasonable amount of expected growth, future growth is *not* the primary driver. Rather, distribution utilization is driven primarily by customers' current but unpredictable needs for second lines, and also by customer churn and breakage. Verizon VA's spare distribution capacity is critical to complying with current service requirements imposed by the Virginia Commission concerning Verizon VA's ability to provision service almost immediately in any area to any customer. Thus, AT&T/WorldCom's effort to suggest that Verizon VA's proposed distribution utilization factor relates entirely to future customer growth is simply wrong. ***Copper Feeder and RT Common Equipment Utilization:*** Verizon has shown that administrative spare, growth capacity, and breakage limits utilization of copper feeder and RT common equipment, and that without appropriate spare, it is far more difficult and

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			costly to maintain continuous, quality service. Churn also has an impact on copper feeder and RT common equipment utilization, because it produces idle-assigned capacity in the network -- a more efficient option than sending out a field dispatch to reassign pairs that likely will soon be working. The spare capacity Verizon VA has shown is needed for these purposes is discussed in Verizon's engineering guidelines, to which AT&T/WorldCom refer repeatedly and apparently admit are a reliable indication of industry practice. ***Service Plug-In (Channel Unit) Utilization:*** Verizon VA has shown that, even though it is possible to maintain higher utilization rates for service plug-ins than for RT common equipment, administrative spare, churn, and growth capacity limits utilization of RT service plug-ins. AT&T/WorldCom acknowledge that it is appropriate to account for growth when installing service plug-ins, but their proposed utilization factor for service plug-ins fails to account for administrative spare requirements and the effects of churn. ***Fiber Strand Utilization:*** Verizon VA has shown that breakage has a particularly significant impact on fiber strand utilization due to the 12-strand ribbon structure used to manufacture most fiber cables. Though it would be possible to increase utilization through the use of fiber cables containing individual loose strands, such cable requires substantially higher installation costs that would far outweigh any savings from the increased utilization. There is no reason to expect that the demand for DSL and dark fiber will have any significant impact on fiber

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			utilization rates in the foreseeable future. ***Conduit Utilization:*** Verizon VA's conduit utilization factor reflects efficient structure design and construction. The high costs of digging a trench, the small incremental costs of installing additional ducts in a trench, and municipal restrictions on repeated excavations make it efficient to install sufficient duct capacity to accommodate growth needs for the lifetime of the plant. AT&T/WorldCom's proposed adjustments to Verizon's conduit costs ignore the fact that building conduit with one fewer duct per trench would produce only minimal initial savings and would increase future maintenance and growth costs. VZ-VA Panel Direct at 100-116; VZ-VA Recurring Panel at 104-147. ***The Modified Synthesis Model Uses Completely Unrealistic and Inefficient Utilization Rates:*** The Modified Synthesis Model contravenes the Commission's recommendation and accepted planning standards and guidelines for building an efficient, forward-looking network by adopting UNE fill factors that are *higher* than USF fill factors. In addition, the other target utilization factors used by the Modified Synthesis Model are unattainable in a forward-looking network — they are too high to build a distribution plant that adequately accommodates demand fluctuations and customer churn. Moreover, the Model fails to account for the resulting additional costs and delays of having to rearrange or install additional distribution pairs more frequently to meet customer demand for

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			additional lines. Murphy Rebuttal at 84-85. In addition, the Model's extremely high utilization factors assume, incorrectly, that the spare capacity needed to accommodate administrative requirements, churn, demand fluctuations, and demand growth is not a current, forward-looking cost. An efficient telecommunications firm must maintain adequate spare capacity as a *current* cost; otherwise, the cost of accommodating changes in demand will be higher, and the ability to complete repairs and provide quality service will be diminished. Moreover, in a competitive environment, an ILEC must have sufficient spare capacity to respond to increasing volatility in demand and potential requests by CLECs to use its network. Murphy Rebuttal at 83-90. ***Verizon's DS3 High Capacity Loop Costs Are Accurate:*** Verizon VA's studies develop reasonable, forward-looking costs for DS3 high-capacity loops using the same general methodology used for the loop cost study. None of the parties to this case has presented any specific criticisms of Verizon VA's calculation of DS3 high capacity loop costs. VZ-VA Panel Direct at 164-166. ***The Modified Synthesis Model Produces Flawed DS3 Costs:*** The Modified Synthesis Model makes similar errors in estimating DS3 costs as it does with respect to DS1 loop costs, which are discussed above. In addition, AT&T/WorldCom fail to recognize that DS3 high capacity loops cannot be provisioned over copper facilities. They must use either fiber or coaxial cable (or a combination of both) all the way to the customer location. The Model, however, fails to use either of these types

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			of cable to any customer location. Murphy Rebuttal at 42-44. ***Distribution Subloop:.*** Verizon VA's cost studies develop reasonable, forward-looking costs for two-wire and four-wire transmission from the TOPIC to the NID. Verizon VA calculated the loop component of these costs using the same general methodology that was ***used*** in the loop cost study. The OSS component of these costs was developed using the same general methodology that was used in the OSS cost study. None of the parties to this case has presented any specific criticisms of Verizon VA's calculation of distribution subloop costs. VZ-VA Panel Direct at 166-168. ***Feeder Subloops:*** Verizon VA's cost studies develop reasonable, forward-looking costs for DS1 and DS3 transmission of Verizon VA feeder facilities. Verizon VA calculated the loop component of the costs using the same general methodology that was used in the loop cost study (for DS1 subfeeder) and in the DS3 high capacity loop cost studies (for DS3 subfeeder). The OSS component of these costs was developed using the same general methodology that was used in the OSS cost study. None of the parties to this case has presented any specific criticisms of Verizon VA's calculation of feeder subloop costs. VZ-VA Panel Direct at 168-170. ***xDSL-Compatible Loops:*** Verizon VA developed reasonable, forward-looking costs of providing xDSL-compatible loops. These costs consist of the recurring costs of the two-wire or four-wire loop itself, the recurring costs of the mechanized loop qualification database used to determine which loops are qualified for DSL, and certain non-recurring costs of providing xDSL-compatible loops. Verizon VA used its general

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			two-wire and four-wire loop costs for the loop portion, though its forward-looking costs of providing xDSL-compatible loops likely would be higher. None of the parties to this case has presented any specific criticisms of Verizon VA's methodology for calculating the recurring costs of providing xDSL-compatible loops. The non-recurring costs of providing such loops, and the issues relating to the loop qualification database, are described in the Non-Recurring JDPL. VZ-VA Panel Direct at 121-164. ***NIDs:*** Verizon VA developed reasonable forward-looking costs of providing NIDs, taking into account material, installation labor, and other relevant costs. AT&T/WorldCom have not presented any specific criticisms of Verizon VA's calculation of NID costs. VZ-VA Panel Direct at 175-178. ***Element Combinations:*** Verizon VA generally calculates the recurring charge for an element combination by adding the recurring charges for the constituent elements. In the case of expanded extended loops (EELS), Verizon VA identified the reasonable, forward-looking costs of subscriber trouble testing (including testing equipment and related expenses) and recovers those costs through a cost factor. VZ Panel Direct at 233-238. Verizon also proposes non-recurring charges associated with these elements. *See* NRC JDPL.