b. 4-wire Loops

(i) Positions of the Parties

334. AT&T/WorldCom derive the 4-wire loop rate by multiplying the 2-wire loop rate by a factor of 1.7. To arrive at this factor, AT&T/WorldCom adjust the basic 2-wire loop costs by: (1) increasing the NID costs to account for an additional overvoltage protector ($0.03 per month increase in the NID costs); (2) doubling distribution costs to account for the second 2-wire pair; (3) doubling the SAI costs; and (4) increasing total DLC costs by 40 percent.[857] Fiber feeder costs remain unchanged.[858]

335. Verizon contends that these adjustments to the 2-wire loop costs fail to capture the cost differences between the 2-wire loop and the 4-wire loop. First, because AT&T/WorldCom start with their proposed costs for the 2-wire loop, the 4-wire loop costs incorporate all the errors that Verizon attributes to the 2-wire loop costs.[859] Second, Verizon asserts that AT&T/WorldCom compound this problem by making additional errors specific to the 4-wire loop. For example, because 4-wire services generally are provisioned to businesses that have inside terminals instead of NIDs, AT&T/WorldCom inappropriately factor in higher NID costs rather than using the costs of the necessary inside terminals.[860] Verizon also claims that DLC costs should be increased by a factor of four, rather than 40 percent, to account for the additional DLC equipment necessary because, unlike 2-wire loops, 4-wire loops are unable to take advantage of GR-303 DLC concentration capabilities.[861] Finally, Verizon argues that AT&T/WorldCom fail to increase the component common equipment cost allocation by the two to four times necessary to account for the additional plug-in shelves that 4-wire loops require[862] and fail to propose deaveraged rates.[863]

336. AT&T/WorldCom respond that Verizon's contentions are misplaced. First, they claim that they properly establish the 2-wire loop costs.[864] Second, they point out that Verizon's own cost study uses a NID to calculate 4-wire loop costs.[865] Third, they contend that the 2-wire loop costs they propose do not include the concentration functionality, thus there is no need to account for

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857 AT&T/WorldCom Ex. 1, at 23-24; AT&T/WorldCom Ex. 23, Vol. 1 at 10-11, Attach. J.

858 AT&T/WorldCom Ex. 1, at 24; AT&T/WorldCom Ex. 23, Vol. 1 at 11.

859 Verizon Ex. 109, at 38-39; Verizon Reply Cost Brief at 145.

860 Verizon Ex. 109, at 40.

861 *Id.* at 40-42.

862 *Id.*; *see also* Verizon Reply Cost Brief at 145.

863 Verizon Ex. 109, at 42.

864 AT&T/WorldCom Ex. 14, at 49.

865 *Id.* at 50; AT&T/WorldCom Initial Cost Brief at 167-68.

any lack of concentration capabilities for 4-wire loops.[866] Finally, they argue, the plug-in shelves are a *de minimis* component of common equipment costs, and therefore do not have a recognizable effect on 4-wire loop costs.[867]

(ii) Discussion

337. We adopt the component calculations that AT&T/WorldCom propose for the statewide averaged 4-wire loop rate, but we will calculate deaveraged rates in the manner that Verizon proposes.[868] AT&T/WorldCom demonstrate that their out-of-model calculations are reasonable and that Verizon's criticisms do not warrant alternative adjustments. Specifically, AT&T/WorldCom are correct that: (1) Verizon's model uses NID costs to calculate the 4-wire loop costs, and (2) they do not include the savings from concentration in determining the 2-wire loop costs, thus no adjustment is required for 4-wire loops.[869] Further, Verizon fails to identify the specific effect of AT&T/WorldCom's alleged understatement of the plug-in shelves component of common equipment costs. Finally, we agree with Verizon that the 4-wire loop rate should be deaveraged. The Virginia Commission previously deaveraged 4-wire loop rates,[870] and AT&T/WorldCom offer no reason for us not to do so here. We therefore will deaverage the 4-wire loop rate using the method previously adopted by the Virginia Commission (which we are also using to deaverage the 2-wire loop rate).

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[866] AT&T/WorldCom Ex. 14, at 49-50; AT&T/WorldCom Initial Cost Brief at 168; AT&T/WorldCom Reply Cost Brief at 72.

[867] AT&T/WorldCom Ex. 18, at 9-11; AT&T/WorldCom Initial Cost Brief at 168; AT&T/WorldCom Reply Cost Brief at 72.

[868] Although we adopt the specific changes that AT&T/WorldCom propose, because we apply them to the average 2-wire loop costs that we calculate (as opposed to the costs calculated by AT&T/WorldCom), the cost relationship between the 4-wire loop and the 2-wire loop will be a factor different from the 1.7 factor that results from AT&T/WorldCom's calculations.

[869] *See* Verizon Ex. 107, at 177-78.

[870] *To Determine Prices Bell Atlantic-Virginia, Inc. is Authorized to Charge Competitive Local Exchange Carriers in Accordance with the Telecommunications Act of 1996 and Applicable State Law*, Case No. PUC970005, Final Order at 15-16 (Virginia Commission 1999) (*Virginia Commission 1999 Order*) (adopting *To Determine Prices Bell Atlantic-Virginia, Inc. is Authorized to Charge Competitive Local Exchange Carriers in Accordance with the Telecommunications Act of 1996 and Applicable State Law*, Case No. PUC970005, Staff Exhibit (Comparative Summary of Pricing Recommendations) at 17-19 (filed June 5, 1997) (*Virginia Staff Report*)).

c. DS-1 and DS-3 Loops

(i) Positions of the Parties

338. AT&T/WorldCom calculate DS-1 and DS-3 loop costs by determining the cost relationship between these loops and the basic 2-wire loop.[871] To do so, they first determine, based on Verizon ARMIS data,[872] that the average number of DS-0 equivalents per physical, non-switched DS-1 and DS-3 lines is approximately 8.0.[873] Because the 8:1 ratio includes a mix of DS-1s and DS-3s, AT&T/WorldCom then determine the ratios for DS-1s and DS-3s individually.[874] Relying on the Commission's *Transport Rate Structure Order*, AT&T/WorldCom assume that the DS-3:DS-1 cost ratio is 9.6:1.[875] AT&T/WorldCom also assume that 90 percent of non-switched lines are DS-1s and 10 percent are DS-3s.[876] Applying these two relationships, AT&T/WorldCom calculate DS-1 costs to be 4.3 times DS-0 costs and DS-3 costs to be 41.3 times DS-0 costs (*i.e.*, 9.6 times DS-1 costs).[877]

339. Verizon urges us to reject AT&T/WorldCom's DS-1 and DS-3 loop cost calculations. Verizon contends that AT&T/WorldCom improperly use a different DS-0 equivalent factor in determining the DS-1 and the DS-3 loop rates than they use to determine the 2-wire loop rates. Specifically, AT&T/WorldCom use a 12:1 DS-0 to DS-1 ratio and a 9.6:1 DS-3 to DS-1 ratio to determine DS-1 and DS-3 loop costs, while using a 24:1 DS-1 to DS-0 ratio and a 28:1 DS-3 to DS-1 ratio in their proposed DS-0 loop cost calculations.[878] Verizon also asserts that AT&T/WorldCom fail to provide support for their 12:1 DS-1 to DS-0 ratio or their 9:1 ratio of DS-3s to DS-1s,[879] and that they fail to account for sufficient investment for DS-1 electronics.[880] Finally,

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[871] AT&T/WorldCom Ex. 1, at 25-26; AT&T/WorldCom Ex. 23, Vol. 1 at 11-12.

[872] AT&T/WorldCom claim that they rely on 2002 ARMIS data. *See* AT&T/WorldCom Ex. 1, at 25 n.28; AT&T/WorldCom Ex. 23, Vol. 1 at 12 n.8. ARMIS data for 2002 (and 2001) were not available at the time of the hearing. We believe it likely that, if AT&T/WorldCom relied on ARMIS data, they used 2000 ARMIS data, and assume so in our analysis.

[873] AT&T/WorldCom Ex. 1, at 25; AT&T/WorldCom Ex. 23, Vol. 1 at 11-12.

[874] AT&T/WorldCom Ex. 1, at 25; AT&T/WorldCom Ex. 23, Vol. 1 at 11-12.

[875] *See Transport Rate Structure and Pricing*, CC Docket No. 91-213, Third Memorandum Opinion and Order on Reconsideration, 10 FCC Rcd 3030, 3039, 3049, 3062, paras. 13, 33-34, 62-63 (1994) (*Transport Rate Structure Order*).

[876] AT&T/WorldCom Ex. 1, at 25; AT&T/WorldCom Ex. 23, Vol. 1 at 12.

[877] AT&T/WorldCom Ex. 1, at 25-26; AT&T/WorldCom Ex. 23, Vol. 1 at 12. Specifically, AT&T/WorldCom's formulas are: (90% * 4.3) + (10% * 4.3 * 9.6) = 8. (4.3 * 9.6) = 41.3. In the first formula, AT&T/WorldCom solve for the 4.3. AT&T/WorldCom Ex. 1, at 26 n.29.

[878] Verizon Ex. 109, at 42-44; Verizon Reply Cost Brief at 138-40.

[879] Verizon Ex. 109, at 43-44.

[880] *Id.* at 37.

AT&T/WorldCom do not propose deaveraged DS-1 loop rates.[881] Other than the rates determined from its cost studies, however, Verizon does not offer any specific counter proposal.

340. AT&T/WorldCom respond that they account for sufficient investment in DS-1 electronics (*i.e.*, line cards) by including costs for DS-0 line card slots in the DLC for the DS-0 equivalent counts.[882] AT&T/WorldCom also contend that Verizon is incorrect in its claim that AT&T/WorldCom use a 12:1 DS-0 to DS-1 equivalent cost ratio, when they actually use a 4.3:1 ratio.[883] They defend the 9.6:1 DS-1 to DS-3 ratio as the same ratio that the Commission adopted in the *Transport Rate Structure Order*.[884] AT&T/WorldCom also claim that Verizon's cost study produces relationships between DS-0 and DS-1 cost and between DS-1 and DS-3 costs similar to those AT&T/WorldCom propose.[885] AT&T/WorldCom propose a DS-1 loop rate that is 4.3 times their proposed average DS-0 loop rate and a DS-3 loop rate that is 9.6 times their DS-1 loop rate; Verizon proposes a DS-1 rate that is 6.1 times its DS-0 rate and a DS-3 rate that is 10.0 times its DS-1 rate.[886] Finally, AT&T/WorldCom claim that the use of ratios to determine the DS-1 and the DS-3 loop rates different from those used to determine the 2-wire loop costs is simply an allocation issue, and that it does not undermine the ratios used to determine the DS-1 and the DS-3 loop rates.[887]

(ii) Discussion

341. We will use the 4.3:1 DS-1 to DS-0 and the 9.6:1 DS-3 to DS-1 out-of-model factors proposed by AT&T/WorldCom to establish rates for the DS-1 and the DS-3 loop types. Although we are troubled by the lack of thoroughness and clarity in AT&T/WorldCom's analysis,[888] their factors are, nevertheless, the only factors proposed and therefore the only option before us. Verizon did not propose alternative factors.

342. We conclude that these factors are reasonable in light of Verizon's proposed rates and Commission precedent. AT&T/WorldCom are correct that the ratios in Verizon's proposed

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[881] *Id.* at 42.

[882] AT&T/WorldCom Ex. 1, at 25-26; AT&T/WorldCom Ex. 23, Vol. 1 at 12; AT&T/WorldCom Initial Cost Brief at 167; AT&T/WorldCom Reply Cost Brief at 71.

[883] AT&T/WorldCom Ex. 14, at 50.

[884] AT&T/WorldCom Ex. 1, at 25 (citing *Transport Rate Structure Order*, 10 FCC Rcd at 3062, paras. 62-63); *see also* AT&T/WorldCom Ex. 14, at 50.

[885] AT&T/WorldCom Ex. 14, at 50-51.

[886] *See* Tr. at 4483; AT&T/WorldCom Initial Cost Brief, Attach. at 1.

[887] *See* AT&T/WorldCom Initial Cost Brief at 125.

[888] We have been unable, in our review of ARMIS data from various years including 2000, to identify the starting point for the AT&T/WorldCom calculations – *i.e.*, the 8.0, which represents the number of DS-0 equivalents per physical, non-switched DS-1 and DS-3 lines.

rates (from the LCAM) are similar to those they propose. Specifically, using Verizon's proposed statewide average 2-wire, DS-1, and DS-3 loop rates, the ratios are 6.1 and 10.0, respectively. In addition, in the *Access Charges Reform First Report and Order*, the Commission found that the ratio of outside plant (*i.e.*, loop) costs for PRI ISDN lines[889] to basic analog lines was approximately 5 to 1.[890] The Commission based this determination on cost studies submitted by Bell Atlantic, Ameritech, Pacific Bell, and US West.[891] The Bell Atlantic study (which included Virginia) alone, moreover, showed a 4.13 to 1 ratio.[892]

343. Because we are using the MSM to generate 2-wire loop rates,[893] we do not consider using the LCAM to establish DS-1 loop rates or the Verizon High Capacity Access Cost (Hi-Cap) model to establish DS-3 loop rates. The MSM and the LCAM and Hi-Cap models are fundamentally different models that use widely varying assumptions and inputs that are not possible to reconcile with any reasonable degree of confidence. Using these different models to determine the costs of different loop types would, therefore, invariably result in Verizon either over- or under-recovering its total outside plant costs, and thus violate the Commission's TELRIC rules.[894]

344. Although we use AT&T/WorldCom's cost factors to determine the DS-1 and the DS-3 loop rates, we agree with Verizon that AT&T/WorldCom create total cost and cost allocation problems by using different DS-0 equivalent computations (4.3:1 and 9.6:1) to determine DS-1 and DS-3 loop rates than they use to determine the DS-0 loop rates (24:1 and 28:1). As we explain in

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[889] We assume, for purposes of this arbitration, that PRI ISDN loop costs and DS-1 loop costs are the same because Verizon submits a single cost study, establishing a single set of rates, for DS-1 loops and for PRI ISDN loops. For this same reason, although AT&T/WorldCom do not offer testimony specific to PRI ISDN loop costs, we find that the rates for the PRI ISDN type loop shall be the same as those we establish herein for the DS-1 loop type.

[890] *See Access Charge Reform*, CC Docket Nos. 96-262, 94-1, 91-213, 95-72, First Report and Order, 12 FCC Rcd 15982, 16028-34, paras. 111-22 (1997) (*Access Charge Reform First Report and Order*) (using this cost ratio to cap at 5 the number of end-user common line charges (*i.e.*, subscriber line charges or SLCs) that may be assessed by price cap carriers for a PRI ISDN service). The Commission relied on this decision in extending the rule to non-price cap carriers in 2001 in the MAG Order. *Multi-Association Group (MAG) Plan for Regulation of Interstate Services of Non-Price Cap Incumbent Local Exchange Carriers and Interexchange Carriers*, CC Docket Nos. 00-256, 96-45, 98-77, 98-166, Second Report and Order and Further Notice of Proposed Rulemaking in CC Docket No. 00-256, Fifteenth Report and Order in CC Docket No. 96-45, and Report and Order in Docket Nos. 98-77 and 98-166, 16 FCC Rcd 19613, 19640-41, para. 56 (2001) (*MAG Order*).

[891] *Access Charge Reform First Report and Order*, 12 FCC Rcd at 16030-33, paras. 113-20. The Commission excluded the cost study submitted by NYNEX, which showed a higher ratio, because it was determined to be an outlier. *Id.* at 16030-31, para. 113.

[892] *Id.* at 16030-31, para. 113.

[893] *See supra* section IV(B)(2).

[894] *See* 47 C.F.R. § 51.505(a-b).

detail elsewhere in this order, we resolve these problems by removing special access lines from the DS-0 loop cost calculations.[895]

345. Finally, we agree with Verizon that the DS-1 loop rate should be deaveraged. The Virginia Commission previously deaveraged DS-1 loop rates[896] and AT&T/WorldCom offer no reason for us not to do so here. We therefore adopt, for the DS-1 loop rate, the Verizon proposed deaveraging methodology, which is the same as that originally adopted by the Virginia Commission.[897]

2. xDSL, Off Premise Extension, and 4-wire CSS Loops

a. Positions of the Parties

346. Verizon proposes that the rates for xDSL loops and for off premise extension loops should be the same as the rates for the basic 2-wire loop.[898] AT&T/WorldCom do not challenge these positions.

347. The Verizon proposal for, and the AT&T/WorldCom restatement of, the 4-wire customer specified signaling (CSS) rates are the same as their proposed rates for the basic 4-wire loop.[899]

b. Discussion

348. Because there is no dispute among the parties on these points, we adopt the same rates for xDSL loops and for off premise extension loops that we establish for basic 2-wire loops. Similarly, because there is no disagreement among the parties, we adopt the same rates for 4-wire CSS loops that we establish for basic 4-wire loops.

3. 2-wire CSS, 2-wire ISDN BRI, and 4-wire DDS Loop Types

a. Positions of the Parties

349. The parties did not submit testimony specific to the 2-wire CSS, 2-wire ISDN BRI,

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[895] *See supra* section IV(C)(2)(b)(ii).

[896] *Virginia Commission 1999 Order* at 15-16 (adopting *Virginia Staff Report* at 17-19).

[897] We note that neither side proposes deaveraged DS-3 loop rates, and that the Virginia Commission did not previously require DS-3 loop rates to be deaveraged. *See Virginia Commission 1999 Order* at 15-16 (adopting *Virginia Staff Report* at 17-19).

[898] Verizon Ex. 107, at 81, 125. Verizon defines an off premise extension unbundled loop as "a service that allows subscribers to receive phone calls placed to the same telephone number at two different subscriber locations." *Id.* at 81.

[899] *See* AT&T/WorldCom Initial Cost Brief, Attach. at 1.

or 4-wire digital data services (DDS) loop types. Verizon proposes to establish rates for these loop types using its loop cost studies.[900] Other than providing general descriptions of these loop types,[901] Verizon fails to offer any testimony or other evidence to explain its cost studies for these loop types or to support the inputs and assumptions reflected therein. AT&T/WorldCom do not offer any affirmative proposal to establish rates for these loop types. They provide detailed testimony challenging many of the inputs and assumptions used by Verizon in its LCAM study generally, which apply to all loop types, but they do not offer any challenges specific to these loop types.[902]

b. Discussion

350. Neither Verizon nor AT&T/WorldCom offer feasible proposals to establish TELRIC rates for these loop types. Both proposals rely on the LCAM, and, as we explain below, using the LCAM to establish rates for the 2-wire CSS, 2-wire ISDN BRI, and 4-wire DDS loops presents significant problems. To avoid these problems, we adopt rates for these loops based on cost ratios (as opposed to absolute values) derived from the LCAM.

351. Relying on the LCAM (including its inputs and model algorithms) for these three loop types, as the parties suggest, while using the MSM (including its inputs and model assumptions) as the basis to establish rates for other loop types admittedly raises significant issues regarding data mismatches. Simply put, the cost inputs and algorithms vary greatly between the cost models. The parties fail to provide sufficient evidence to enable us to resolve these problems. Neither side devotes any significant testimony or briefing to issues specific to these loop types. Verizon includes a skeletal summary of what these loop types are, and AT&T/WorldCom include a single paragraph of testimony that points the reader to their workpapers.[903] In order for us to establish rates for these loop types, we would therefore need to modify the LCAM to ensure its consistency with the MSM without any meaningful assistance from the parties. This we decline to do.

352. We note, moreover, that we do not expect there to be any significant demand for at least the 2-wire CSS and 4-wire DDS loops. These two loop types represent very old technologies. CSS should be necessary only where signaling system 7 (SS7) networks have not been deployed. DDS lines should be necessary only to support certain very old and slow modems (*e.g.*, early digital 2400 kbps modems). Arguably, because neither of these loop types represents the most efficient technology currently available, we should not be establishing separate rates for these loop types.

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[900] *See* Verizon Ex. 100P, Vols. II-III, Parts B-2 (2-wire CSS), B-4 (2-wire ISDN BRI), and B-5 (4-wire DDS) (confidential version).

[901] Verizon Ex. 107, at 81-82.

[902] *Compare* AT&T/WorldCom Ex. 12, at 19-79, *with* AT&T/WorldCom Ex. 12, at 94-95.

[903] Verizon Ex. 107, at 81-82; AT&T/WorldCom Ex. 12, at 95-96. Although AT&T/WorldCom attempt to restate all of Verizon's loop rates, they acknowledge that they have not proposed all of the necessary adjustments. *See* AT&T/WorldCom Ex. 12, at 10, 12, 16, 19, 36.

Neither side raises this concern, however, and both propose rates for these loop types. We, therefore, will establish rates for these loop types. Nevertheless, given the minimal interest of the parties in these loop types and the fact that we may not use the LCAM for these loop types, we decline to adopt either side's proposal.

353. We therefore employ an alternative approach to generate cost-based rates for these three loop types. Having found cost ratios an appropriate basis for determining DS-1 and DS-3 loop rates,[904] we develop a similar cost ratio method to establish rates for the 2-wire CSS, 2-wire ISDN BRI, and the 4-wire DDS loop types. In particular, we use the ratios between the rates for these loop types (individually) compared to the rates for the basic 2-wire or 4-wire loop (as appropriate) from the AT&T/WorldCom restatement of Verizon's loop rates, and apply these ratios to the 2-wire or 4-wire (as appropriate) loop rates established in this order. Using this approach ensures that rates for all loop types are based on a single cost model and, thus, a uniform network design and uniform set of assumptions and cost inputs.

354. We begin our calculations with the basic 2-wire loop rates that we derive from the MSM[905] to determine rates for the 2-wire CSS and the 2-wire ISDN loop types, and with the basic 4-wire loop rates to determine rates for the 4-wire DDS loop type. We then apply to these rates (*i.e.*, the basic 2-wire and 4-wire loop rates) the cost ratios reflected in the LCAM between these loop types (*e.g.*, the ratio between the LCAM basic 2-wire loop rates and the LCAM 2-wire CSS loop rates). The following table identifies the ratios (in italics) between these loop types, using both the AT&T/WorldCom restatement rates and the Verizon proposed rates:[906]

[904] *See supra* section IV(D)(1)(c).

[905] *See infra* App. E, F.

[906] *See* AT&T/WorldCom Initial Cost Brief, Attach. at 1.

	ATT/WC	Verizon		ATT/WC	Verizon	ATT/WC 2W CSS/2W BUL	Verizon 2W CSS/2W BUL	% Difference Between ratios
2W BUL			2W CSS					
Cell 1	**4.98**	**17.86**	**Cell 1**	**7.00**	**25.85**	***1.41***	***1.45***	***2.9%***
Cell 2	7.37	26.31	Cell 2	9.49	34.50	*1.29*	*1.31*	***1.8%***
Cell 3	11.77	43.45	Cell 3	13.71	50.95	*1.16*	*1.17*	***0.7%***
AVG.:	6.18	22.33	AVG.:	8.20	30.28	*1.33*	*1.36*	***2.2%***

	ATT/WC	Verizon		ATT/WC	Verizon	ATT/WC 2W BRI/2W BUL	Verizon 2W BRI/2W BUL	
2W BUL			2W BRI					
Cell 1	4.98	17.86	Cell 1	5.91	23.14	*1.19*	*1.30*	***8.4%***
Cell 2	7.37	26.31	Cell 2	8.28	31.83	*1.12*	*1.21*	***7.1%***
Cell 3	11.77	43.45	Cell 3	12.65	48.87	*1.07*	*1.12*	***4.4%***
AVG.:	6.18	22.33	AVG.:	7.09	27.66	*1.15*	*1.24*	***7.4%***

	ATT/WC	Verizon		ATT/WC	Verizon	ATT/WC 4W DDS/4W CSS	Verizon 4W DDS/4W CSS	
4W BUL - CSS			4W DDS					
Cell 1	*19.69*	*56.81*	Cell 1	21.77	60.29	*1.106*	*1.061*	***-4.2%***
Cell 2	24.80	74.19	Cell 2	27.52	78.99	*1.110*	*1.065*	***-4.2%***
Cell 3	32.55	106.49	Cell 3	36.14	113.18	*1.110*	*1.063*	***-4.5%***
AVG.:	22.01	65.50	AVG.:	24.37	69.67	*1.107*	*1.064*	***-4.1%***

355. By way of example, if we apply the ratio analysis and use the ratios generated from the Verizon proposed rates, we would calculate the 2-wire CSS loop rate (see first line of the table above, in bold) for zone 1 by multiplying the basic 2-wire loop rate, zone 1, by 1.45. Were we instead to use the ratios generated from the AT&T/WorldCom restatement rates, we would use a ratio of 1.41 instead of 1.45. In this instance, using the ratio based on the Verizon proposed rates instead of the AT&T/WorldCom restatement rates would generate a 2.9 percent higher 2-wire CSS loop rate (for zone 1).

356. To complete this analysis, we must determine whether to use the ratios generated from the Verizon proposed rates or the AT&T/WorldCom proposed restatement rates. Electronics costs comprise a significant proportion of loop costs, and one of the major cost drivers for electronics is the type of DLC systems used. In determining basic 2-wire loop costs, we concluded that fiber-based loop feeder plant should use 100 percent NGDLC systems.[907] Because we adopt AT&T/WorldCom's position on that issue, and because electronics are a significant loop cost driver, we will use the ratios that result from the AT&T/WorldCom restatement rates rather than from the Verizon proposed rates. In reaching this conclusion, we note that the difference between the AT&T/WorldCom and Verizon ratios (the last column in the table, above) is generally small (less than five percent for all three loop types in all density zones, except for the 2-wire ISDN BRI loop type in zones 1 and 2). We further note that,

[907] *See supra* section IV(C)(2)(k).

although the AT&T/WorldCom ratios result in lower 2-wire CSS and 2-wire BRI ISDN loop rates than do the Verizon ratios, the AT&T/WorldCom ratios also result in higher 4-wire DDS loop rates. The effect, therefore, of our decision to use the AT&T/WorldCom ratios instead of the Verizon ratios is minimal.

V. SWITCHING

357. Local circuit switching refers to line-side and trunk-side facilities used to connect separate lines and trunks, including all of the features, functions, and capabilities of the switch. The Commission's TELRIC pricing rules apply to the rates charged when switching is offered as a UNE.[908] The *Local Competition First Report and Order* and the Commission's rules, however, provide only general guidance on the proper rate structure for incumbent LECs to use in recovering switching costs. The rules specify that an incumbent LEC shall recover local switching costs "through a combination of a flat-rated charge for line ports and one or more flat-rated or per minute usage charges for the switching matrix and for trunk ports,"[909] and tandem switching costs "through usage-sensitive charges, or in another manner consistent with the manner that the incumbent LEC incurs those costs."[910]

358. In its universal service orders, the Commission provided additional guidance for determining forward-looking switching costs. It identified the following guidelines for modeling local switching costs: individual switches should be identified as host, remote, or stand-alone; investment costs should be developed separately for each of these switch types; switch capacity constraints should be included; and modern, high-capacity digital switches should be used.[911] The Commission concluded that both models presented at the time -- the Benchmark Cost Proxy Model (BCPM) 3.0, which relied in part on the SCIS model, and HAI 5.0 -- "meet the . . . requirement that a model assume the least-cost, most-efficient and reasonable technology to provide the supported services."[912] It further concluded that the HAI model better satisfied the forward-looking pricing methodology than did the BCPM/SCIS model primarily because: (1) the HAI model is less complex than the BCPM/SCIS model, but "still provid[es] a degree of detail that is sufficient for the accurate computation of costs for federal universal service purposes;" and (2) proprietary SCIS model data were not entered into the record of that proceeding.[913] The Commission then incorporated the HAI switching cost computations into the

[908] 47 C.F.R. § 51.501 (TELRIC pricing rules apply to UNEs).

[909] 47 C.F.R. § 51.509(b); *see also* 47 C.F.R. § 51.507(c).

[910] 47 C.F.R. § 51.509(e); *see also* 47 C.F.R. § 51.507(c).

[911] *Platform Order*, 13 FCC Rcd at 21353, 21355, paras. 72, 76.

[912] *Id.* at 21355, para. 76.

[913] *Id.* at 21354-56, paras. 75, 77-78.

SM.[914] In so doing, however, the Commission expressly stated that switching costs are less significant than loop costs for universal service purposes,[915] and therefore it devoted less analysis to the switching and interoffice platforms and cost inputs than would have been necessary for purposes of determining unbundled switching and transport costs.[916]

A. Cost Model

1. Positions of the Parties

359. Verizon submitted cost studies to determine the costs of, and thereby the rates for, unbundled end-office and tandem switching.[917] The starting point in the Verizon switching cost study is the SCIS model.[918] The SCIS model is a computer system that has two modules, SCIS/Model Office (SCIS/MO) and SCIS/Intelligent Network (SCIS/IN).[919] The SCIS/MO module is used to develop switching investments and processor-related investments associated with features that do not require any specific, unique hardware.[920] The SCIS/IN module is used to develop incremental investments associated with vertical features.[921] Verizon uses the SCIS model to estimate the initial capital outlay for the physical material of the end-office and tandem switching equipment.[922]

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[914] *Id.* at 21354-57, paras. 75-80. HAI 5.0 uses a single cost module to determine both switching and transport costs. *See id.* at 21354, para. 74. In the universal service proceeding, the Commission adopted this module for use in determining switching and common transport costs. *See id.* at 21354-57, paras. 75-80; *see also infra* section VI(A).

[915] *Platform Order*, 13 FCC Rcd at 21355, para. 75 ("In our evaluation of the switching modules in this proceeding, we note that, for universal service purposes, where cost differences caused by differing loop lengths are the most significant cost factor, switching costs are less significant than they would be in, for example, a cost model to determine unbundled network element switching and transport costs.").

[916] *Compare Platform Order*, 13 FCC Rcd at 21353-57, paras. 71-80 (switching and interoffice platform), *with id.* at 21335-53, paras. 26-70 (loop platform); *compare Inputs Order*, 14 FCC Rcd at 20277-99, paras. 286-337 (switching and interoffice cost inputs), *with id.* at 20172-277, paras. 33-285 (loop cost inputs).

[917] Verizon Ex. 100P, Vols. V, VI, IX (confidential version); Verizon Ex. 125P (Matt Supplemental Surrebuttal), Attach. A-G (confidential version); Verizon Ex. 161P (Matt Second Supplemental Surrebuttal), Attach. H-M (confidential version). Verizon submitted the Telcordia Common Channel Signaling Cost Information System (CCSCIS) study to determine signaling costs and rates. *See* Verizon Ex. 100P, Vol. VII, Parts E-1 and E-2 (confidential version).

[918] Verizon Ex. 107P, at 179-211 (confidential version).

[919] *Id.*

[920] *Id.*

[921] *Id.*

[922] *Id.*

360. Although the outputs from the SCIS model are the foundation of Verizon's switching cost study, they are only the starting point in the switching cost calculations. Verizon uses additional data and applies calculations outside of the SCIS model to estimate the initial capital outlays for incumbent LEC and vendor labor; Engineer, Furnish, and Install (EF&I) factors; power; land; and buildings.[923] It applies cost factors and adds loadings to the capitalized investment obtained from the SCIS model to derive annual costs of capital, depreciation, income and other taxes, maintenance, overhead, regulatory assessments, uncollectibles, umbilical and SS7 link equipment, and right-to-use (RTU) licenses.[924] Verizon also makes certain adjustments to account for utilization (*i.e.*, fill) rates, and to convert an overall cost estimate that is developed initially on a busy hour equipment capacity minute-of-use (MOU) basis to separate cost estimates for originating and terminating traffic that are expressed on an all hour of the day billable MOU basis.[925]

361. AT&T/WorldCom do not challenge the ability of the Verizon switching cost study, including the SCIS model, to generate TELRIC-compliant switching rates.[926] Rather, they challenge most of the significant inputs used by Verizon to develop switching costs.[927] For example, AT&T/WorldCom contend that the limited data set used by Verizon to model switch prices is not appropriate for a forward-looking cost model because it primarily reflects additions to existing switches, rather than purchases of new switches that generally have a much higher vendor discount.[928] They also allege that the Verizon study does not use sufficiently forward-looking technology assumptions, particularly with respect to the type of DLC systems.[929] Finally, they contend that other costs estimated by Verizon, such as RTU fees that are paid to switch vendors for software, are excessive.[930]

362. AT&T/WorldCom affirmatively propose using the MSM to generate TELRIC-

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[923] *Id.*

[924] *Id.*

[925] *Id.* Converting capacity MOU to billable MOU and busy hour MOU to all hours MOU are discussed *infra* in the section on the Busy Hour to Annual MOU Ratio. *See infra* section V(C)(8).

[926] *See* Tr. at 5386-87 (Q: (Mr. Kwiatkowski) "Do you have any specific criticism of SCIS itself? That is the mathematical formulas reflected in SCIS?" A: (Ms. Pitts) "Overall, probably not.") Indeed, Ms. Pitts, AT&T/WorldCom's lead witness on switching cost issues, was at one point "responsible for the technical development, production, documentation, and customer care for the SCIS family of models." AT&T/WorldCom Ex. 4 (Pitts Direct), at 1.

[927] AT&T/WorldCom Ex. 12P, at 96-124 (confidential version).

[928] AT&T/WorldCom Ex. 12, at 98-104.

[929] *Id.* at 104-107.

[930] *Id.* at 115-118.

compliant end-office and tandem switching rates and signaling rates.[931] The MSM contains a switching and transport module.[932] End-office switching costs in the MSM are based primarily on the regression analysis adopted by the Commission in the universal service proceeding.[933] There, the Commission analyzed the costs for end-office switching equipment using data from switch installations from 1989-1996.[934] It determined that the fixed cost for a host switch and a stand-alone switch was $486,700 and that the fixed cost for a remote switch was $161,800.[935] It further found that the variable cost for host, stand-alone, and remote switches was $87 per line.[936] Given these cost inputs, end-office switching costs in the MSM depend almost entirely on the number of lines per switch and the relative numbers of host, stand-alone, and remote switches in a network. The Switching/Transport module contains capacity checks, based on the number of lines, busy hour call attempts, and busy hour usage,[937] but these checks have minimal effect on the switching cost estimates generated by the MSM. AT&T/WorldCom also rely on the costs and calculations contained in the underlying SM to generate costs and rates for tandem switching.[938]

363. Verizon challenges the use of the MSM Switching/Transport module as fundamentally inappropriate for use in generating UNE rates, and it claims that many of the module's cost inputs are flawed as well. As a threshold matter, Verizon contends that the Switching/Transport module adopted by the Commission to determine switching costs for federal universal service purposes is inappropriate for use in developing absolute unbundled switching rates in Virginia.[939] Verizon asserts that, in the universal service proceeding, the Commission focused not on whether the calculations provided an accurate estimate of TELRIC switching costs, but rather on whether the module functioned sufficiently to calculate federal universal service switching costs.[940] Verizon claims that AT&T/WorldCom have done nothing in

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[931] AT&T/WorldCom Ex. 14, Attach. A; AT&T/WorldCom Ex. 23, Attach. A, J.

[932] AT&T/WorldCom Ex. 14, Attach. A; AT&T/WorldCom Ex. 23, HAI Model Release 5.0a at 53-63 (1998) ("Switching/Transport module"); AT&T/WorldCom Initial Cost Brief at 188. Although AT&T/WorldCom filed a revised version of the Switching/Transport module later in the proceeding to update certain common transport costs, *see* Keffer Dec. 12 Letter, Install A, the general model descriptions provided in the initial cost model filing remain accurate.

[933] *Inputs Order*, 14 FCC Rcd at 20279-93, paras. 290-323.

[934] *Id.* at 20281-91, paras. 296-319.

[935] *Id.* at 20281, para. 296.

[936] *Id.*

[937] AT&T/WorldCom Ex. 23, HAI Model Release 5.0a at 56-57.

[938] *See* AT&T/WorldCom Ex. 23, Attach. A, J.

[939] Verizon Ex. 109, at 47-50.

[940] Verizon Switching Cost Brief at 26 (citing *Platform Order*, 13 FCC Rcd at 21354-56, paras. 75, 78).

this proceeding to improve the accuracy of the switching calculations for use in determining TELRIC switching costs, and that the switching cost estimates produced by the MSM, as well as the input values used to derive them, are therefore not representative of, or appropriate to use to determine, Verizon's forward-looking unbundled switching costs.[941]

364. Verizon contends that the MSM relies on outdated switching data, primarily data from a sample of switches that were deployed between 1989 and 1996.[942] According to Verizon, these input data are not only stale, but they reflect switches that are incapable of providing modern services and features.[943] It argues that many new features have been added to switches since 1996, almost all of which require additional investment, yet the Switching/Transport module fails to account for these modern features and functions or their associated costs.[944] Verizon claims, for example, that the module's data inputs do not reflect the additional costs associated with provisioning ISDN lines on a digital switch,[945] the considerable software investment necessary to comply with the mandates of the Communications Assistance for Law Enforcement Act and LNP obligations,[946] or the requisite hardware modifications included in the current Nortel and Lucent switches.[947] Because it fails to account for the complete range of technologies (both hardware- and software-related) currently being deployed, Verizon alleges that the MSM cannot develop switching costs that will compensate Verizon for all of the switching capabilities that it is required to provide.[948]

365. Verizon also claims that the MSM Switching/Transport module ignores proper switch sizing guidelines and engineering standards, thereby ensuring that the network modeled by the MSM would be incapable of providing adequate and reliable service to Verizon's customers.[949] For example, Verizon contends that the MSM incorrectly assumes that switch sizes are infinitely variable (*i.e.*, that a switch can be sized to meet perfectly the line count in a given

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[941] *Id.*

[942] Verizon Ex. 109, at 47 (stating that switching data in the MSM dates back as far as 1983); Verizon Switching Cost Brief at 29-31.

[943] Verizon Ex. 109, at 47.

[944] Tr. at 5329-30.

[945] Verizon Ex. 109, at 47-48.

[946] Tr. at 5330-31.

[947] Verizon Ex. 109, at 47-48.

[948] Verizon also claims that the MSM significantly understates power and MDF investments, as well as central office construction costs. *Id.* at 91-92, Attach. 4; Verizon Initial Cost Brief at 150-51, 162-63. According to Verizon, these understatements, in turn, result in significantly understated switching costs. *See* Verizon Ex. 109P, at 91-93 (confidential version).

[949] Verizon Ex. 109, at 50-52.

wire center).[950] In practice, however, Verizon notes that switches and switch components come in discrete sizes and cannot be customized to match exactly the demand in a particular wire center.[951] Therefore, according to Verizon, just as breakage requires the deployment of some excess capacity in the context of cables,[952] carriers will similarly incur the cost of some amount of excess switching capacity.[953] Verizon argues, however, that the MSM is incapable of accounting for these and other types of engineering realities.[954]

366. Verizon also asserts that the MSM cannot accurately account for peak period usage. In developing the SM, the Commission stated that a cost model must "ensure that adequate capacity exists in that switching facility to process all customers' calls that are expected to be made at peak periods."[955] Verizon argues, however, that the MSM fails to satisfy this basic criterion because it does not account for the fact that each central office and its associated trunking network experience an annual busy season, as well as a daily busy hour, characterized by periods of peak traffic loads.[956] Rather, the Switching/Transport module provides capacity for the same number of busy hour calls each day of the year without accounting for a busy season.[957] The uniform amount of usage that AT&T/WorldCom posit as peak traffic cannot, Verizon claims, account for peak periods resulting from seasonal fluctuations in demand, such as a resort community for which the bulk of the yearly traffic occurs over a few summer months.[958] As a result, Verizon asserts that the MSM models switches that would be incapable of handling traffic during busy season periods and, therefore, a network on which customers would experience frequent denials of service.[959]

2. Discussion

367. We adopt the Verizon switching cost study, including the SCIS model, because it

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[950] *See* Verizon Switching Cost Brief at 29.

[951] Verizon Ex. 109, at 50-52.

[952] *See supra* note 675.

[953] Verizon Ex. 109, at 50-52; *see also* Verizon Switching Cost Brief at 29.

[954] Verizon Ex. 109, at 50-52; *see also* Verizon Switching Cost Brief at 29.

[955] *Inputs Order*, 14 FCC Rcd at 20164-65, para. 12; *see also id.* at 20277-78, para. 286.

[956] *See* Verizon Ex. 109, at 50-52.

[957] *Id.* at 50.

[958] Resort communities typically experience upwards of 60-75 percent of their total annual traffic during a 2 or 3 month vacation period. *Id.* at 51.

[959] *Id.* at 50-52.

better satisfies the key cost model criteria that we identify above.[960] Specifically, we find that the Verizon switching cost study, as compared to the MSM's Switching/Transport module, better complies with the Commission's TELRIC pricing rules and relies on cost inputs and assumptions that are more transparent, adjustable, and verifiable. To the extent that AT&T/WorldCom raise specific cost input issues, we address these issues in the following subsections.

368. Between the two cost models, only the SCIS model can be adjusted to reflect our findings regarding the most fundamental switching cost input issue: the relative percentages of new and growth switch equipment and the vendor discounts associated with each.[961] As we explain below, efficient carriers will grow their switches over time, and vendors offer different discounts to carriers for new switches than for growth switching equipment. The MSM Switching/Transport module uses inputs based on 100 percent new switch prices, and, presumably, those prices reflect the greater discounts associated with such switches.[962] The module documentation, however, does not identify the specific discount reflected in those prices, nor can the module be modified to account for the lower discount on growth switching equipment. The SCIS model, in contrast, may be adjusted by the user to reflect any desired discount, although Verizon proposes the lower discount based primarily on growth and upgrade purchases. Accordingly, because the key vendor discounts are discernable and adjustable only in the SCIS model, we find the Verizon switching cost study more transparent, adjustable, and verifiable than, and therefore preferable to, the MSM.

369. We also find that the Verizon switching cost study better complies with the Commission's TELRIC rules because it relies on more recent data and therefore better reflects forward-looking switching costs. Verizon's study relies on data from approximately 1998-2000,[963] the most recent data available prior to its submission of its cost studies in July 2001. AT&T/WorldCom, on the other hand, rely on data relating to switches installed between 1989 and 1996. Their proposed forward-looking switching costs are based, therefore, on a sample of switches reflecting decade old equipment. Although it is possible to extrapolate future values by applying regression analysis to historical data, as AT&T/WorldCom propose, the risks associated with such an approach increase the further into the future the historical data are projected, particularly where key variables (*e.g.*, equipment, technology, demand, traffic patterns) change considerably between the period represented by the historical data and the later period. For example, according to Verizon, dial equipment minute (DEM) growth per line occurred at an average rate of approximately one percent from 1989 to 1996, while per line DEM growth occurred at a rate of five percent between 1996 and 2000.[964] Over time, switch vendors

960 *See supra* section III(B)(3).

961 *See infra* section V(C)(1).

962 *See Inputs Order*, 14 FCC Rcd at 20289, para. 315.

963 *See* Verizon Ex. 100P, Vols. V, VI, IX (confidential version); Verizon Ex. 25P, Attach. A-G (confidential version); Verizon Ex. 161P, Attach. H-M (confidential version).

964 Tr. at 5334-36.

modify switch design and service providers modify switch equipment acquisition decisions to accommodate anticipated growth in subscriber usage levels. Because Verizon proposes using the most recent data available, it is not necessary to use an outdated regression trend analysis in the calculation of unbundled switching costs and rates, and instead we rely on the Verizon switching cost study.

370. Technological improvements in switches, moreover, increase the importance of using recent data to determine switching costs. A new switch purchased today can provide more optional or "vertical" features than can the switches reflected in the MSM's sample data. According to Verizon, in the mid-1990s switches included only four vertical features: call waiting, call forwarding, three-way calling, and speed dialing.[965] The Verizon study, in contrast, includes costs for switches that are capable of providing scores of vertical features.[966] There are costs associated with the switch hardware and software required to provide vertical features that should be included in the cost study.[967] The regression equation on which the MSM switch cost inputs are based does not explicitly include a variable for vertical feature costs. Although the regression analysis includes time trend variables intended to capture the effect of time on switch costs,[968] the record does not support a finding that a cost estimate reflecting prices for switches installed between 1989 and 1996, which included relatively few vertical features (and for which there were likely few subscribers), would adequately reflect forward-looking switch costs. Such costs include a considerably larger number of vertical features (and for which there are likely a relatively larger number of subscribers).[969]

371. Similarly, the Verizon switching cost study explicitly includes costs associated

[965] *Id.* at 5334, 5341-42.

[966] The same vertical feature, however, is included more than once in Verizon's tally of vertical features because some may be offered in connection with more than one service. Verizon Ex. 100P, Vol. VI, section 15, subsection 5.8, Features List at 2 (confidential version); Verizon Ex. 125P, Attach. B-1 (confidential version). The number of distinct vertical features that Verizon offered at the time of the hearing, nevertheless, is substantially greater than the number offered in the mid-1990s.

[967] We expect that these costs will increase as the number of vertical feature subscribers increases. Verizon presumably would need to design its switches to reflect anticipated demand for vertical features.

[968] *Inputs Order*, 14 FCC Rcd at 20287-89, paras. 311-14.

[969] Of the 946 switches in the sample on which the MSM Switching/Transport module is based, only 4 are host or stand alone switches that were installed in 1996, and only 22 are host or stand alone switches that were installed in 1995. *See id.* at 20279, para. 290. (We determined the number and timing of the observations comprising the SM's switch sample through review of these data, which are in the custody of the Bureau's Industry Analysis and Technology Division.) Costs for at least some vertical features are not reflected in the data for remote switches because a remote switch relies on a host switch to provide some vertical feature capability. Thus, the quantity and the quality of the information regarding vertical features switch costs reflected in the more recent 1995-96 observations are limited. In other words, whatever information on vertical feature costs that is reflected in the sample derives primarily from the 1989-1994 data. This compounds our concern that the regression equation does not account for today's vertical feature costs.

with switched digital lines, including ISDN. A switch purchased today serves a much larger percentage of digital lines compared to analog lines than did switches installed during 1989-1996.[970] The MSM produces a blended switch cost reflecting the costs for switches in the sample. That composite cost, based on the ARMIS data, reflects a relatively small percentage of high capacity digital lines and a relatively large percentage of low capacity (4 KHz or equivalent) analog lines. ARMIS data show that high capacity (64 kbps or equivalent) digital lines (*e.g.*, ISDN) did not reach one percent of lines until 1993, more than halfway through the sample period, and that they comprised only 4.28 percent of Verizon's switched access lines in 1996, the last year of the period.[971] In contrast, Verizon's study includes data from the year 2000, when ARMIS data indicate that approximately ten percent of the switched access lines served by Verizon's switches in Virginia were high capacity digital lines.[972] We find that a study based on data that explicitly account for the costs associated with digital lines is superior to a regression analysis based on sample data that may not fully account for the considerable increase in the percentage of digital lines occurring subsequent to the sample period.[973]

372. Further, we note that the Commission's adoption of the SM switching and transport module in the universal service proceeding does not compel the same result here. In the *Platform Order*, the Commission expressed a preference for a simpler switching cost study because switching costs are not as critical as loop costs for universal service purposes.[974] Having

[970] It is uncontroverted that the Verizon study includes switching costs associated with providing ISDN services. *See* Verizon Ex. 125P, Attachs. A, B2, B3, B4, D (confidential version); *see also* Tr. at 5196-200. The MSM Switching/Transport module, in contrast, relies on the regression trend analysis applied to data from 1989 to 1996. Indeed, AT&T/WorldCom concede that the SM, and therefore the MSM, does not produce cost estimates for ISDN. Tr. at 5197, 5199; *see also* AT&T/WorldCom Ex. 16 (Pitts Surrebuttal), at 4. The study that served as the basis for the MSM switching cost regression equation also indicates that ISDN switching costs are not fully reflected in the SM. *See* Gabel Study, *supra* note 765, at 114 ("During the years covered by this data set the overwhelming majority of the lines were for voice service. Therefore, to a large extent, the per line investment estimates do not reflect the additional costs associated with providing ISDN lines on a digital switching machine.").

[971] ARMIS Report 43-08, Table III (Access Lines in Service of Customer).

[972] *Id.* In addition, the MSM's regression trend analysis relies on data from 1989-1996, years in which, according to Verizon, DEMs grew by approximately one percent, and extrapolates such data to 1996-2000, years in which DEMs grew by approximately five percent. Tr. at 5334-36. We question the accuracy of using trend terms from a slow DEM growth period to estimate costs for a subsequent relatively fast growth period.

[973] Because, for the above stated reasons, we find the Verizon switching cost study preferable to the MSM Switching/Transport module, we need not address Verizon's other criticisms (*e.g.*, MDF and power costs, central office construction costs, peak period investment) of the MSM.

We note that neither side offered any significant testimony in support of its signaling cost studies. Because we adopt the Verizon switching cost study and because signaling is usually only provided in conjunction with switching, we adopt the CCSCIS to generate signaling rates. For the reasons we explain *infra* in section IX, we require Verizon to rerun its signaling cost study incorporating our findings regarding cost of capital, depreciation, and ACFs.

[974] *See Platform Order*, 13 FCC Rcd at 21354-55, paras. 75, 77.

concluded that the Verizon cost study is superior to the MSM for calculating unbundled switching costs, we place less weight on the relative simplicity of the MSM's Switching/Transport module. Similarly, concerns expressed in the universal service proceeding regarding the SCIS model's use of proprietary data do not arise here.[975] In this proceeding, AT&T/WorldCom and Bureau staff have had access to the Verizon study and its underlying data. Indeed, AT&T/WorldCom were able to re-run the Verizon switching cost study using different input data and thereby to propose restated switching rates.[976]

373. Finally, we have considered the effects of adopting the MSM for loop rates and the Verizon cost study for switching rates and believe that doing so is reasonable in the circumstances before us. In contrast to the relative cost analysis performed in the universal service proceeding, here the TELRIC rules require that we establish rates for each UNE, including switching, based on the costs attributable to that UNE.[977] Rates for a particular UNE are based on the total costs of the element divided by the total demand for the element.[978] Consistency between assumptions and data for the costs and the demand of a particular element is, therefore, crucial to determining the per unit costs of that element. Identity of model assumptions and data between different elements is not essential so long as they otherwise meet our key model criteria. Neither side, however, submitted cost studies that contain identical or consistent inputs and assumptions across all elements. For example, Verizon did not optimize inputs and outputs between its switching and loop cost studies,[979] and AT&T/WorldCom propose using the MSM for some UNEs and Verizon's cost studies for others.[980]

B. Shared Cost Allocation Between End-Office and Tandem Switching Functions

374. In the Verizon switching cost study, nine of the switches are combined end-office and tandem switches.[981] All other switches are either exclusively end-office switches or exclusively tandem switches.[982] In order to calculate end-office and tandem switching costs, we must determine the appropriate allocation of costs that are shared between end-office switching

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975 *See id.* at 21355-56, paras. 77-78.

976 AT&T/WorldCom Ex. 12, at 97; AT&T/WorldCom Ex. 24 (Pitts Supplemental Surrebuttal), at 18-19.

977 *See* 47 C.F.R. § 51.505(a)-(c).

978 *See* 47 C.F.R. § 51.505(b).

979 Tr. at 4141-42.

980 *See infra* sections VI(A), IX.

981 Verizon Ex. 125 (Matt Supplemental Surrebuttal), Attach. H. Each combined switch in the Verizon study is a Lucent 5ESS switch. *Id.*

982 *See id.*

and tandem switching functions.

1. Positions of the Parties

375. Verizon proposes allocating shared costs as follows: It first uses the SCIS/MO to estimate the pure end-office switch costs.[983] Verizon then re-runs the SCIS/MO to estimate the combined pure end-office switch and combined end-office/tandem switch costs.[984] It determines the amount by which costs obtained in the second model run exceed those obtained in the first model run to arrive at the incremental investment associated with adding tandem trunks to end offices.[985] Verizon proposes to allocate only this incremental tandem investment to tandem switching.[986]

376. AT&T/WorldCom oppose Verizon's approach to allocating shared end-office and tandem switching costs. They contend that end-office switching costs should reflect efficiencies associated with combined end-office/tandem switch equipment.[987] Specifically, they assert that, for combined switches, the "getting started,"[988] equivalent POTS half call (EPHC), and SS7 link investment costs are common to both end-office and tandem switching functions.[989] They propose allocating "getting started" and EPHC investments to end-office switching and to tandem switching based on the relative number of local line and trunk ports and tandem ports.[990] They further propose developing allocation factors by converting line ports to equivalent trunk ports, because line ports use fewer switch resources than do trunk ports and because lines are concentrated whereas trunks have dedicated paths through the switch.[991] AT&T/WorldCom propose using a 4:1 line concentration ratio[992] to determine the number of trunk ports (*i.e.*, divide

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[983] We use the term "pure end-office switch" to refer to a switch that provides line-to-line and line-to-trunk, but not trunk-to-trunk, switching.

[984] We use the term "combined end-office/tandem switch" to refer to a switch that provides line-to-line, line-to-trunk, and trunk-to-trunk switching.

[985] Verizon Ex. 161 (Matt Second Supplemental Surrebuttal), at 5-6.

[986] *Id.*

[987] AT&T/WorldCom Ex. 24, at 10-13

[988] The "getting started" cost of the switch, also known as the "first cost," represents the costs of the central processor, memory, maintenance, administrative, test, and spare equipment, and other common equipment. Similarly, "getting started" investment refers to investment for such equipment, and "getting started" equipment refers to this equipment.

[989] AT&T/WorldCom Ex. 24, at 12.

[990] *Id.*

[991] *Id.* at 12 n.18.

the number of lines by four) in this allocation.[993] They also contend that SS7 link investments are limited to trunks and therefore should be allocated based on the relative number of end-office trunk ports and tandem trunk ports.[994]

2. Discussion

377. We adopt Verizon's approach to allocating costs that are shared between end-office and tandem switching functions. As a preliminary matter, we note that the effect of using AT&T/WorldCom's proposed allocation factors instead of Verizon's would be fairly minimal. AT&T/WorldCom estimate that use of their allocation factors would reduce Verizon's end-office switch costs by only four percent.[995]

378. Verizon's approach is preferable for several reasons. First, as we explain *infra* in the end-office switching rate structure section, we require Verizon to recover end-office switching costs, including "getting started," EPHC, and SS7 link costs, on a flat, per line basis, and not on a per MOU basis.[996] Any "getting started," EPHC, and SS7 link costs shared between tandem and end-office switch functions that are allocated to tandem switching would, however, under the parties' proposed tandem rate structures, be recovered on a per MOU basis. Second, recovery of these shared costs through either element will permit total element cost recovery and should not affect the total payments made by competitive LECs. Because the shared costs that AT&T/WorldCom propose allocating to tandem switching would equal precisely the shared costs that would be allocated away from end-office switching, and because we expect that competitive LECs that purchase unbundled end-office switching are also likely to purchase unbundled tandem switching, competitive LEC payments for these two switching elements

(Continued from previous page)

[992] Line concentration enables a LEC to reduce the number of DS-1 feeder facilities necessary by assigning a feeder transmission path as a telephone call is made instead of dedicating a specific channel in the feeder plant to a particular line at all times. *See* Verizon Ex. 122, at 183-85; Verizon Switching Cost Brief at 14. Concentration is possible because not all callers use the telephone at the same time.

[993] AT&T/WorldCom Ex. 24, at 12 n.18. In their restatement of the Verizon studies, AT&T/WorldCom allocate "getting started" and EPHC investments to end-office switching and tandem switching, respectively, based on the following formulas: ((lines/4) + local trunks)/((lines/4) + local trunks + tandem trunks) and tandem trunks/((lines/4) + local trunks + tandem trunks). They apply these allocation factors to 5ESS end-office switch and combined end-office/tandem switch investment. They do not apply these factors to Nortel or Siemens switch investment because none of the Nortel or Siemens switches is a combined end-office/tandem switch. *Id.*; *see also infra* section V(C)(3).

[994] AT&T/WorldCom Ex. 24, at 12 n.18. In their restatement of the Verizon studies, AT&T/WorldCom allocate SS7 link investments to end-office switching and tandem switching, respectively, based on the following formulas: local trunks/(local trunks + tandem trunks) and tandem trunks/(local trunks + tandem trunks). They apply these allocation factors to 5ESS end-office switch and combined end-office/tandem switch investment. They do not apply these factors to Nortel or Siemens switch investment because none of the Nortel or Siemens switches is a combined end-office/tandem switch. *Id.*

[995] *See id.* at 12.

[996] *See infra* section V(D).

would not vary significantly regardless of the allocation of shared costs.[997] AT&T/WorldCom fail to provide an economic rationale to support their proposed allocation factors, and, indeed, there is no absolute economically "correct" method of allocating shared costs. Accordingly, we find it preferable to allocate the shared switching costs to end-office switching because, as we explain *infra*, end-office switching costs will be recovered on a flat, per line basis.[998]

379. In addition, we note that AT&T/WorldCom do not justify their proposal to use a 4:1 line concentration ratio to convert line ports to equivalent trunk ports. This concentration ratio would be used to convert all of Verizon's lines to equivalent trunk ports and therefore should be based on the average of the efficient ratios for all lines. Although AT&T/WorldCom acknowledge that line concentration ratios vary widely, they propose the same 4:1 line concentration ratio they recommend for use with GR-303 NGDLC systems.[999] They fail to offer evidence, however, that the concentration ratio that they recommend for GR-303-based lines represents an average of the efficient ratios for all of Verizon's lines, including both analog lines and GR-303-based lines.

C. Cost Inputs

380. Having chosen a switching cost model and determined the allocation of shared end-office/tandem switching costs, we now resolve the cost input issues raised by the parties.

1. Switch Discount

a. Positions of the Parties

381. There is no dispute that large carriers such as Verizon routinely receive substantial discounts off the manufacturer's list price when purchasing switches.[1000] In the SCIS model, the amount of this discount represents a significant variable in calculating switch prices. The amount of the discount may vary considerably depending on whether the discount is for new switches or for additional equipment to accommodate additional users.[1001]

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[997] Verizon argues that AT&T/WorldCom's proposed allocation methodology would reallocate combined end-office and tandem switch costs between end-office and tandem switching elements, but would not change the total amount of these costs. Verizon Reply Cost Brief at 113-14. We agree with Verizon based on our review of AT&T/WorldCom's restatement of Verizon's end-office and tandem switching cost studies.

[998] *See infra* section V(D).

[999] Analog line concentration is engineered within the switch, whereas GR-303-based line concentration is engineered outside the switch in the DLC system. As we explain *infra*, we adopt for GR-303 lines Verizon's proposed 3:1 concentration ratio rather than AT&T/WorldCom's proposed 4:1 ratio. *See infra* section V(C)(3).

[1000] *See, e.g.*, AT&T/WorldCom Switching Cost Brief at 5; Verizon Switching Cost Brief at 1-2.

[1001] *See, e.g.*, AT&T WorldCom Switching Cost Brief at 5; Verizon Switching Cost Brief at 1-2, 3-4.

382. Verizon states that its proposed switching costs properly reflect the best available estimate of the discounts that Verizon would receive as it incrementally upgrades and expands its network and that they are therefore appropriate for use in determining its forward-looking switching costs.[1002] Verizon bases the discount it uses in the SCIS model for the Lucent 5ESS switch and the Siemens EWSD switch on the discount it received on year 2000 purchases.[1003] It bases the discount for the Nortel DMS-100 and DMS-200 switches on the discount reflected in its current contract with Nortel and the purchases Verizon expects to make under this contract.[1004] Verizon's proposed discounts reflect almost entirely the discounts it receives on additions to existing switches (the "growth discount," as opposed to the "new switch discount"), because the purchases on which the proposed discounts are based are almost entirely for switch growth and upgrade equipment.[1005] Verizon argues that AT&T/WorldCom's proposed all-new switch discount is unrealistic and has been previously rejected by this Commission, the D.C. Circuit, and state commissions as inconsistent with TELRIC principles.[1006]

383. AT&T/WorldCom argue that the Commission's TELRIC pricing rules require the use of the most efficient technology and thus assume the deployment of new switching equipment.[1007] Therefore, they argue that the new switch discount is the appropriate discount for calculating the cost of this equipment.[1008] Furthermore, although the discounts that vendors give for purchasing a new switch historically have been greater than the discounts for add-on equipment or growth to an existing switch, AT&T/WorldCom assert that, more recently, Verizon has filed testimony in a variety of proceedings stating that the discounts it now receives for growth equipment have deepened and are roughly the same as the discounts for a new switch.[1009] Thus, AT&T/WorldCom argue that it is reasonable to rely entirely on new switch discounts when developing switch costs in this proceeding.

384. In contrast to the extensive record developed concerning end-office switching, the

[1002] Tr. at 5230, 5235; Verizon Switching Cost Brief at 4. Verizon's proposed discounts and supporting data for the Lucent 5ESS switch and Nortel DMS-100 and DMS-200 switches are set out in its cost studies. *See* Verizon Ex. 100P, Vol. IX, Tab VA Switch Discount Support, Exhibit Part C-P1 and Part C-P2 (confidential version). Its proposed discount and supporting data for the Siemens EWSD switch are set out in Verizon Ex. 122P (Recurring Cost Panel Surrebuttal), Attach. O (confidential version).

[1003] Verizon Ex. 122, at 166-67.

[1004] *Id.* at 167.

[1005] *See id.*; Verizon Ex. 125P, Attach. D (confidential version); Verizon Ex. 212P (Verizon response to record request no. 28 (requested Nov. 28, 2001)) (confidential version).

[1006] Verizon Switching Cost Brief at 6-7, 9-10 (citing *AT&T Corp. v. FCC*, 220 F.3d at 618).

[1007] AT&T/WorldCom Switching Cost Brief at 5-7; AT&T/WorldCom Reply Cost Brief at 82.

[1008] AT&T/WorldCom Switching Cost Brief at 6-7; AT&T/WorldCom Reply Cost Brief at 82.

[1009] AT&T/WorldCom Reply Cost Brief at 82.

parties devote little attention to tandem switching issues in their oral and written testimonies. Although the issues associated with tandem switching are similar to those associated with end-office switching, distinctions do exist and we address these distinctions as necessary.

b. Discussion

385. Switch vendors typically have provided relatively large discounts on the carrier's initial switch investment and smaller discounts on growth jobs based on their expectation that the carrier would grow the switch over time.[1010] A LEC that seeks to minimize switching costs over time may: (1) install a relatively large switch (on which there typically is a relatively large vendor discount) built to satisfy current demand and any demand growth expected over the life of the switch; or (2) install a relatively smaller switch built to satisfy current demand, and then "grow" the switch by adding components (on which there is a relatively small vendor discount) over time as demand increases. An efficient carrier would be expected to choose the option that has the least cost on an expected present value basis,[1011] *i.e.*, the expected value of the initial and the future cash outlays associated with each option discounted to present worth at the company's cost of capital.

386. Switching has a high degree of modularity, making it relatively cost effective to grow a switch over time by adding components to it.[1012] Moreover, as Verizon argues, efficient carriers do add to or grow their switches over time,[1013] presumably because they expect this approach to minimize costs. By growing the switch over time, rather than installing a large switch, the carrier reduces the risk and cost of installing too much capacity, given that demand growth is always uncertain. Furthermore, by growing the switch over time, the carrier reduces the risk and cost of installing unused capacity that becomes obsolete and is replaced, given that technological change is also uncertain. The carrier also reduces the costs of financing and maintaining the switch over its life by growing it over time.[1014]

[1010] *See, e.g., Georgia/Louisiana 271 Order*, 17 FCC Rcd at 9059, para. 81 (generally, vendors have provided a greater discount for new switches and smaller discounts for growth or expansion of existing switches).

[1011] Present value refers to the worth today of a payment, or a series of payments, to be made in the future. The concept of present value is illustrated by asking the following question: how much money today is equivalent to $100.00 one year from today, if this sum can be invested and earn a 10 percent annual rate of return? The answer is $90.91 because $90.91 invested at ten percent would grow to 100.00 ($100.00/1.10). In this example, $90.91 is the present value of $100.00 payable one year from today.

[1012] Verizon Ex. 123 (Garfield Surrebuttal), at 10-11; AT&T/WorldCom Ex. 12, at 113-14; Tr. at 5440-42, 5445-47.

[1013] Verizon Ex. 122, at 166-67.

[1014] If carriers did not typically grow their switches over time, it is unlikely that switch vendors would provide relatively large discounts on the initial switch investment. *Id.* at 178-179; Verizon Switching Cost Brief at 9-10; Verizon Reply Cost Brief at 101-102; *see also Joint Application by BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in* (continued....)

387. Accordingly, as a threshold matter, we conclude that TELRIC-based switch costs should reflect switch manufacturer prices for both new equipment and growth equipment; therefore, we reject both Verizon's proposed discount (based largely on growth additions) and AT&T/WorldCom's proposed discount (based entirely on new switch purchases). This limited departure from baseball arbitration is consistent with Commission precedent regarding switch discounts in the context of section 271 applications. Upon consideration of arguments similar to those presented here, the Commission found that an assumption of 100 percent growth additions is inconsistent with TELRIC principles, but it also rejected arguments that the TELRIC rules require an assumption of 100 percent new switches.[1015]

388. In order to implement this conclusion, we require Verizon to use in the SCIS model three separate vendor discounts to model costs attributable to end-office switching, as set forth in sections V(C)(1)(b)(i)(a), V(C)(1)(b)(ii)(a), and V(C)(1)(b)(iii), below. First, we will use the discounts that Verizon currently receives on new switches in order to calculate "getting started" investment.[1016] Second, we will use a weighted average discount reflecting Verizon's current discount on new switches and growth equipment in order to estimate switch investment other than "getting started," trunk port, and SS7 link investment. Third, we will use a separate discount for end-office switching investment attributable to trunk ports and SS7 links.

389. We must also develop vendor discounts for new switches and growth equipment for use in the SCIS model to develop tandem switching costs. Based on the record before us, we conclude that the appropriate discounts for tandem switching costs are similar to the discounts for end-office switching.[1017] For tandem switching, however, we conclude that we need only two discounts. We will use the discounts that Verizon currently receives on new switches for tandem switching "getting started" investment. We will use a weighted average discount reflecting Verizon's current discounts on new switches and growth equipment for estimating tandem switch investment, other than "getting started" investment.

(Continued from previous page)
Alabama, Kentucky, Mississippi, North Carolina, and South Carolina, WC Docket No. 02-150, Memorandum Opinion and Order, 17 FCC Rcd 17595, 17635, para. 83 (2002) (*BellSouth Multistate 271 Order*) (levels of new and growth switch discounts reflect vendors' judgments about anticipated purchases); *Georgia/Louisiana 271 Order*, 17 FCC Rcd at 9059, para. 81 (vendor discounts are valid only when an overall purchase of both new and growth equipment is made).

[1015] *See, e.g., Rhode Island 271 Order*, 17 FCC Rcd at 3318, para 34 (The Commission "strongly question[ed]" an assumption of 100 percent growth additions. "Although an efficient competitor might anticipate some growth additions over the long run, rates based on an assumption of all growth additions and no new switches do not comply with TELRIC principles."); *Georgia/Louisiana 271 Order*, 17 FCC Rcd at 9059-60, para. 82 (rejecting AT&T's claim that the use of a mix of new and growth switch purchases in a cost model may never be used to determine forward-looking costs, because it may not be cost-effective to acquire all of the projected need at the outset).

[1016] As we explain *supra* note 988, the "getting started" equipment is the central processor, memory, maintenance, administrative, test, and spare equipment, and other common equipment.

[1017] *See, e.g.,* Verizon Ex. 107, at 194.

(i) "Getting Started" Switch Investment Discount

(a) End-Office Switch "Getting Started" Investment

390. As we discuss more fully below, we conclude that end-office "getting started" investment is best estimated using the discounts that Verizon currently receives on new switches. Thus Verizon should estimate end-office "getting started" investment using the discounts it received on new switch purchases in 2000.[1018]

391. We agree with AT&T/WorldCom that, for purposes of selecting the appropriate switch discount, the "getting started" costs are fixed costs.[1019] That is, they are costs that do not vary with the number of lines, trunks, or usage on the switch. Verizon agreed with AT&T/WorldCom that switch manufacturers today design switches that are limited only in the number of lines that they can serve.[1020] As Verizon noted at the hearings, advances in digital switching have increased the capacity of the switch to as many as 250,000 lines.[1021] Each of Verizon's wire centers in Virginia serves far fewer than 250,000 switched access lines.[1022] Verizon acknowledges, moreover, that the central processor of the Lucent 5ESS switch, which accounts for a large majority of Verizon's switch costs and lines,[1023] will not exhaust.[1024] Verizon also states that it has not had to install as many new switches in recent years as it would have had the processor limit been exceeded.[1025] The SCIS model is consistent with these real-world experiences. The office-by-office results in Verizon's SCIS study show extremely low levels of processor utilization, indicating that the amount of traffic on switches could increase tremendously without the need to add processor capacity.[1026] Verizon's study also shows that the central processor of each of its switch technologies is expected to have so much capacity that it

[1018] In response to a staff record request, Verizon identified the discounts it actually received in 2000 on new Lucent 5ESS, Nortel DMS-100, and Siemens EWSD switches. *See* Verizon Ex. 216P (Verizon response to record request no. 32 (requested Nov. 28, 2001)) (confidential version). We direct Verizon to use these actual new switch discounts to estimate end-office "getting started" investment for the Lucent 5ESS, Nortel DMS-100, and Siemens EWSD switches in its compliance filing. *See id.*

[1019] *See* AT&T/WorldCom Ex. 4, at 7-8; AT&T/WorldCom Ex. 12, at 11-12.

[1020] Tr. at 3448-49.

[1021] *Id.* at 5381-82, 5449-50.

[1022] Verizon Ex. 226P (Verizon response to record request no. 42 (requested Nov. 29, 2001)) (confidential version).

[1023] *See* Verizon Ex. 123, at 10; *see also* Verizon Ex. 125P, Attach. D (confidential version).

[1024] Tr. at 5457 (Gansert: "[O]ur assumption at the current time would be that for most of our switches the central processor is not going to exhaust.").

[1025] *Id.* at 5449 (Gansert: "[I]t's true that if you exceeded the [processor's] limit, you would have to put in more switches, and over recent years we haven't been doing that.").

[1026] AT&T/WorldCom Ex. 12, at 111-12.

need not be replaced over the life of the switch.[1027] Finally, the SCIS model user guide indicates that the "getting started" costs for the switch technology in the Verizon study that accounts for most of the investment and most of the lines are independent of both usage and the number of lines.[1028]

392. Verizon does provide examples of components of the "getting started" equipment that it has replaced or augmented over the life of the switch.[1029] Verizon fails, however, to provide empirical evidence to quantify the extent to which it has grown or replaced the "getting started" components of the switch. It does not, for example, provide any evidence to support an estimate of the percentage of overall investment in the "getting started" components of a modern switch that would be installed initially and the percentage that would be installed subsequent to the initial installation date. These examples therefore do not undermine the other record evidence that supports the conclusion that the new switch discount is appropriate for estimating the "getting started" investment.

393. Moreover, whatever the extent to which "getting started" equipment is replaced or augmented, Verizon acknowledges that a primary reason for doing so is to upgrade the switch, not to accommodate growth, especially for the Lucent 5ESS switch, which comprises the majority of Verizon's switch investment.[1030] To the extent that "getting started" equipment is augmented or replaced for reasons other than growth, use of a discount other than the new switch discount to develop "getting started" investment would result in rates that recover from current subscribers costs for future upgrades from which they receive no benefit today.

394. Finally, Verizon's experience with regard to replacing or augmenting "getting started" equipment derives in part from switches that were installed many years ago and that have had lives exceeding those that may be expected for a modern digital switch installed today, the starting point for developing forward-looking costs. That is, a switch installed today may never reach the age of a number of Verizon's existing switches. We recognize that a modern digital switch installed today may have a relatively shorter life by prescribing a 12-year switch life as the basis for calculating depreciation expense.[1031] This 12-year life is at the low end of the Commission's safe-harbor range and likely is shorter than one that we would have prescribed for developing unbundled switching prices several years ago. Given that a digital switch installed today would have a shorter life than one installed years ago, we also would expect that

[1027] *Id.*

[1028] AT&T/WorldCom Ex. 24P (Pitts Supplemental Surrebuttal), at 16-17 (confidential version); *see also* Verizon Ex. 123, at 6 (stating that SCIS models "the investment for processor-related equipment and other equipment independent of switch size (*i.e.*, lines and trunks) and traffic").

[1029] Verizon Ex. 122, at 175.

[1030] *Id.* at 178; Tr. at 5434-38, 5440-41 (for example, carriers might add processing capacity over time to run application software that supports advanced features or to accommodate new regulatory mandates, such as LNP).

[1031] *See supra* section III(D)(3).

commensurately less of the "getting started" equipment would be replaced or augmented over the life of a switch installed today than would be the case with respect to a switch installed years ago. Thus, based on the record before us, we find it inappropriate to use a discount other than the new switch discount to estimate "getting started" investment.

395. We base the new switch discounts for use in estimating the "getting started" investment on the discounts Verizon actually received on new switch purchases it made in 2000.[1032] These discounts are appropriate for calculating forward-looking costs, because they are discounts actually received through a competitive bidding process on recent (as of the time the record closed) new switch purchases.

396. Verizon argues that use of the switch discounts it received on new switch purchases to calculate the weighted average discount would understate its costs because digital circuit switching is at the end of its life-cycle.[1033] It argues that vendors offer higher discounts at the end of a life-cycle because research and development costs for these switches are lower than at the beginning of the cycle.[1034] We disagree. Record evidence indicates that an efficient carrier would receive this discount on the purchase of a new switch today, and that is the appropriate basis for determining the level of the vendor discount under the Commission's TELRIC rules. There is no record evidence that Verizon is replacing digital circuit switches with a newer technology, *e.g.*, packet switches. Moreover, as noted above, the relatively short 12-year depreciation life we adopt for switching adequately captures the effect of nearing the end of the digital switching life-cycle on an efficient carrier's switching costs.[1035]

397. AT&T/WorldCom restate Verizon's switch cost study by basing investment for each component of the switch on the new switch discount.[1036] In this re-statement, they use new switch discounts reflected in Verizon's contracts with Lucent, Nortel, and Siemens that were obtained through discovery in a UNE pricing proceeding before the New Jersey Commission.[1037] AT&T/WorldCom argue that, for one of these switch technologies, use of the discount obtained during the New Jersey proceeding in their restatement of Verizon's cost study results in an overstatement of Verizon's costs because Verizon acknowledges receiving a much higher

[1032] As we explain below, these discounts also will be used in calculating the weighted average discount used to estimate investment other than "getting started" investment.

[1033] Verizon Ex. 213P (Verizon response to record request no. 29 (requested Nov. 28, 2001)) (confidential version); Verizon Switching Cost Brief at 5-6.

[1034] Verizon Ex. 213P (confidential version); Verizon Switching Cost Brief at 5-6.

[1035] *See supra* section III(D).

[1036] AT&T/WorldCom Ex. 12, at 104.

[1037] *Id.* at 104, Attach. 3.