

1 at points in the network where they can be utilized when new relief jobs occur, for  
2 example. Thus, over time, these pairs should be used. Moreover, the effects of  
3 breakage are already accounted for in the three-to-five year reinforcement  
4 guideline. For example, an engineer may not be able to relieve a feeder route with  
5 exactly three years of spare capacity because the smallest cable that would provide  
6 at least three years of spare capacity would actually provide four years of spare  
7 capacity. The engineer would then provide four years of spare capacity. But he  
8 would still act within the guideline.

9 **Q. DO YOU AGREE WITH VERIZON'S ASSERTION THAT DEMAND**  
10 **PEAKS LOWER THE UTILIZATION RATE?**

11 A. No. Verizon claims that “[m]aintaining a margin of available facilities necessary  
12 to accommodate unexpected demand peaks efficiently reduces the average  
13 utilization of network capacity.<sup>37</sup> However, the demand fluctuations that Verizon  
14 describes are part of everyday occurrences in the outside plant and are already  
15 engineered into the feeder cables. Moreover, standard industry practice requires  
16 that the plant must be clearly monitored and replenished in sufficient time to  
17 preclude any service delays.

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<sup>37</sup> *Id.*

1 **Q. DO YOU AGREE WITH VERIZON'S ASSERTION THAT THE DEMAND**  
2 **GROWTH THAT CAUSES CABLES TO EXHAUST AND REQUIRE**  
3 **RELIEF RESULT IN A LOW UTILIZATION RATE?**

4 A. No. Verizon states that "demand growth" causes cables to exhaust and require  
5 relief. Verizon then concludes that the continual relief efforts result in utilization  
6 rates distributed across some "utilization continuum."

7 Verizon is mistaken at two levels. First, as explained above, growth in  
8 future demand cannot, from a costing perspective, increase the capacity costs  
9 properly attributed to current ratepayers. Second, Verizon is mistaken even from  
10 an engineering perspective. Although the process cycle from relief to exhaust of  
11 facilities does occur, to insinuate, as Verizon does, that that process somehow  
12 results in an overall low utilization rate is incorrect and misleading. While it is  
13 reasonable to expect that some cables and routes will be reaching critical exhaust  
14 while others will have just been replenished, as we have discussed above, this  
15 simply means that while some cables and routes will have close to 100%  
16 utilization, others – those that have just been relieved – will have three year to five  
17 years of spare capacity. Even using the five year figure, the minimum utilization  
18 of a route assuming a 3% growth rate on each route will then be 82% and the  
19 average will be far higher.

20 **Q. DOES VERIZON'S CLAIM THAT THE 56% FIGURE REPRESENTS ITS**  
21 **ACTUAL UTILIZATION RATE COMPORT WITH YOUR**  
22 **EXPERIENCE?**

23 A. No. In the experience of Mr. Riolo, it is conservative to assume an 80%  
24 utilization rate. In addition, if Verizon's utilization rate is really 56%, this would  
25 show that Verizon is acting inefficiently. With an average network growth rate of

1           3% per year, Verizon’s 56% utilization rate allows for almost 15 years of growth  
2           without the average route in its plant needing any relief. There is no need to  
3           provide so much excess capacity. As explained above, if Verizon were following  
4           industry standard guidelines or its own guidelines, only three to five years excess  
5           capacity would be provided and utilization would be at least the 80% that we  
6           have estimated.

7   **Q.    IS THERE ANYTHING ELSE WRONG WITH VERIZON’S**  
8   **ASSESSMENT OF UTILIZATION OF COPPER FEEDER?**

9   A.    Yes. Verizon further states that the “[t]he smaller the number of units that are  
10       actually in service (*i.e.* the lower the utilization) ... the greater is the fraction of  
11       the cost of the facility that must be assigned to each filled unit” (emphasis  
12       added).<sup>38</sup> Verizon includes defective pairs as non-utilized pairs. But if Verizon  
13       acted efficiently there would be few defective pairs in its network. Pairs are not  
14       defective when they arrive, and there is no reason that many defective pairs should  
15       exist. In any event, in a reconstructed network with brand new copper feeder,  
16       there would be few defective pairs.

17                The data in Verizon’s LART Report that is included in its cost study  
18        reveal that 429,639 or 6.3% of the cable pairs in Verizon’s Distribution Areas  
19        (“DAs”) are defective. A reconstructed network would not have defective pairs.  
20        Because Verizon’s copper utilization rate excludes the defective pairs, it is plainly

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<sup>38</sup> Verizon Cost Panel Testimony at 36.

1           evident that Verizon's copper feeder utilization rate is understated by that same  
2           margin.

3                       **3.       RT PLUG-IN UTILIZATION**

4   **Q.    WHAT IS A PLUG-IN CHANNEL UNIT?**

5    A.    A plug-in channel unit is used with Digital Loop Carrier (DLC).  DLC systems are  
6           deployed to transport calls to and from individual customer signals more  
7           efficiently from the Remote Terminal equipment in the vicinity of the customer to  
8           the Central Office.  As its name implies, the carrier is digital in nature, whereas  
9           the signal originating at the customer location is analog.  For this reason, the  
10          analog signal from the customer's cable pair is converted to a digital signal at the  
11          interconnection of the cable pair to the DLC electronics.  The conversion takes  
12          place at the plug-in channel unit.

13 **Q.    VERIZON CLAIMS THAT THE APPROPRIATE FORWARD-LOOKING**  
14 **UTILIZATION RATE FOR DLC SERVICE PLUG-INS IS 80%.  DO YOU**  
15 **AGREE?**

16 A.    No.  Since these channel units are relatively costly but easy to transport and install,  
17          prudent inventory control must be used to manage these assets properly.  There is  
18          no reason to have a significant number of idle units when each unit is expensive  
19          and when units can easily be installed if new ones are needed.  **[BEGIN**

20 **VERIZON PROPRIETARY] \*\*\* [END VERIZON PROPRIETARY]**

21          Thus, for example, a DLC serving 600 lines and growing at a rate of 3% annually  
22          or 1.5% semi-annually would normally be equipped with additional channel units  
23          of spare capacity of 9 lines (600 x 0.015).  Since POTS channel units serve 4 lines  
24          each, a minimum of 3 cards (3 x 4 =12 lines) would be required to meet the

1 requirements for 9 lines. The utilization rate would therefore be 98% (600/612).  
2 As a result, a utilization rate of 90% is reasonable and achievable by Verizon on a  
3 forward-looking basis.

4 **Q. VERIZON SUGGESTS THAT THE MAXIMUM THEORETICAL**  
5 **UTILIZATION RATE FOR PLUG-INS IS 90%.<sup>39</sup> IS THAT TRUE?**

6 A. No. It is costly, inefficient, and wholly unnecessary to maintain the channel unit  
7 plug-in capacity that Verizon recommends. Even Verizon concedes that channel  
8 units are easily installed.<sup>40</sup> There is no reason that a rate well above 90% could  
9 not theoretically be achieved. Moreover, Verizon's unacceptably low 80%  
10 channel unit plug-in fill factor means that it is advocating the maintenance of 20%  
11 spare capacity for channel unit cards that will simply sit on DLC RT shelves.  
12 Assuming an annual 3% growth in second lines, Verizon's recommended plug-in  
13 fill factor means that there would be 7 years of idle spare plug-in cards. In view  
14 of the rapid advances in electronic chip technologies, these spare channel units  
15 could well become obsolete before they are ever used. Additionally, Verizon's  
16 definition of utilization is wrong. The service plug-ins that are left at recently  
17 vacated-premises should be counted as cut-throughs or idle assigned units in the  
18 numerator of the fill factor ratio. Thus, contrary to Verizon's claim, customer  
19 churn would not yield a reduction in the fill factor. In any event, Verizon has not

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<sup>39</sup> Verizon Cost Panel Testimony at 108.

<sup>40</sup> Verizon Cost Panel Testimony at 107.

1 shown that an efficient firm in a competitive market would leave a significant  
2 number of plug in units in place in unoccupied units.

3 **Q. VERIZON CLAIMS THAT SUFFICIENT CAPACITY TO**  
4 **ACCOMMODATE SHORT-TERM GROWTH DEMAND PEAKS WOULD**  
5 **YIELD REDUCED LEVELS OF PLUG-IN EQUIPMENT UTILIZATION.**  
6 **IS THAT TRUE?**

7 A. No. The 6 months supply of spare channel units recommended in Verizon's own  
8 engineering guidelines is designed to accommodate service demands. Service  
9 demands include what Verizon euphemistically refers to as "short-term growth"  
10 and "peak demands."

11 **Q. COULD YOU SUMMARIZE THE BASIS ON WHICH YOU CHANGED**  
12 **THE RT PLUG-IN UTILIZATION?**

13 A. The adjustment was made based on the fact that plug-in equipment capacity,  
14 unlike other components of the outside plant facility, is readily expandable.  
15 Lightweight, easily transportable, and installable plug-ins are installed on a  
16 regular basis to handle 6-months' worth of growth. At 3-percent annual growth,  
17 this would amount to justification for a 98.5-percent fill factor. Thus we believe  
18 that 90 percent is conservative.

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**4. RT COMMON ELECTRONICS UTILIZATION**

**Q. THE VERIZON PANEL REFERS GENERALLY TO “R.T. COMMON ELECTRONICS.” WHAT ARE “COMMON ELECTRONICS”?**

A. The term “common electronics” as used by Verizon Panel in this proceeding is misleading. When the Verizon Panel discusses “common electronics,”<sup>41</sup> it appears to refer only to the Litespan 2000 RT Channel Bank Assembly (CBA). But in addition to the Channel Bank Assembly, the Litespan 2000 RT also includes a Common Control Assembly (CCA). Despite this misnomer, the Verizon cost model appears appropriately to include both the common control assembly and the channel bank assembly in apportioning costs for common electronics.

**Q. FOR CLARITY, WOULD YOU DESCRIBE THE TWO MAJOR COMPONENTS OF LITESPAN 2000 RT?**

A. Yes. The Common Control Assembly is the basic unit that includes the common electronics used to provide DLC. It contains, for example, those electronic plug-in cards that are needed to serve all of the individual lines, such as the Common Optical Group.

The Common Control Assembly can support up to nine Channel Bank Assemblies. The Channel Bank Assembly houses up to 56 channel units (plug-ins), along with a pair of redundant controller cards, three load sharing power supplies and four auxiliary modules. The plug-in units provide service to

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<sup>41</sup> Verizon Cost Panel Testimony at 103

1 individual lines, and the utilization rate for those units has been discussed  
2 separately above.

3 **Q. HOW DOES VERIZON DETERMINE ITS UTILIZATION RATE FOR**  
4 **COMMON ELECTRONICS?**

5 A. Verizon appears to determine the utilization rate for common electronics by  
6 simply assuming this utilization rate would be the same as that for copper feeder,  
7 which Verizon states is 56.9%. As noted above, Verizon significantly understates  
8 the rate for copper feeder. Moreover, the utilization rate for common electronics  
9 should be higher than that for copper feeder. Common electronics can be installed  
10 much more quickly than copper feeder. The equipment can be purchased pre-  
11 assembled at the factory. Thus, the equipment can be installed shortly before the  
12 capacity of the existing equipment is reached.

13 **Q. ARE THERE OTHER FLAWS IN THE APPLICATION OF THE**  
14 **VERIZON MODEL TO “COMMON ELECTRONICS”?**

15 A. Yes. The Verizon model apportions the investment associated with the “common  
16 electronics” across only POTS loops. Additionally, the model assumes that a  
17 56.9% utilization rate adjustment should be applied based on Verizon’s embedded  
18 network. The model assumes that the embedded network design is forward-  
19 looking. Moreover, the model incorrectly assumes that the minimum size DLC  
20 unit is a 224 line equivalent unit.

1 **Q. SHOULD THE VERIZON MODEL APPORTION THE INVESTMENT**  
2 **ASSOCIATED WITH THE “COMMON ELECTRONICS” ACROSS POTS**  
3 **LOOPS ONLY?**

4 A. No. Although Verizon contends that capacity must be relatively low as a result of  
5 breakage, services other than POTS services, such as ISDN and DS1 loops, will  
6 also utilize the RT common equipment, increasing utilization levels. The  
7 “common electronics” as defined by the Verizon model serve a myriad of services  
8 that are provisioned over DLC systems, including Special Services and ISDN.  
9 Accordingly, it is wholly inappropriate to apportion all of these investment costs  
10 over only 2 wire POTS loops, as the Verizon model does, and assess the  
11 utilization rate for the common electronics as if they were only used for 2 wire  
12 POTS loops.

13 **Q. CAN THE EMBEDDED NETWORK BE CONSIDERED FORWARD-**  
14 **LOOKING FOR THE PURPOSE OF APPORTIONING “COMMON**  
15 **ELECTRONICS”?**

16 A. No. Verizon’s assumption that an entire Litespan 2000 unit often will have to be  
17 used to serve a relatively small number of customers assumes the current  
18 groupings of customers in its embedded network. Under the scorched-node  
19 assumption of TELRIC, a new entrant is not bound by existing UAA or DA  
20 boundaries. Rather, UAAs and DAs will be redefined to produce grouping  
21 sufficiently large to maximize RT common equipment utilization.

22 By contrast, the patchwork embedded network design has evolved over a  
23 number of decades under a variety of circumstances. Further, local engineers,  
24 pursuant to vintage guidelines, designed the network to serve an ever-shifting  
25 customer base. The net result, the existing embedded network, was planned based

1 on the judgment of numerous individual engineers. This often resulted in the  
2 creation of UAAs and DAs which feed into small SAIs. A forward-looking  
3 network would use larger SAIs. **[BEGIN VERIZON PROPRIETARY] \*\*\***  
4 **[END VERIZON PROPRIETARY]** If large SAIs were used, there would be far  
5 fewer instances in which an RT DLC system served a small number of customers  
6 and utilization would be significantly higher.

7 **Q. HOW DOES THE VERIZON MODEL'S SELECTION OF A 224 LINE**  
8 **CHANNEL BANK ASSEMBLY AFFECT THE DLC "COMMON**  
9 **ELECTRONICS" INVESTMENT?**

10 A. The common equipment utilization levels Verizon is able to achieve in its cost  
11 study are driven, in part, by assumptions relating to the capacity of the common  
12 equipment assumed to be deployed in each DA. The Verizon study assumes a  
13 minimum RT size of 224 lines. As we explained above, many of the DAs served  
14 by Verizon on DLC include only a handful of lines. Serving these with 224-line  
15 capacity DLC's results in utilization levels for that expensive equipment that  
16 approach zero. A more realistic forward-looking design would provision small  
17 DA's with 96, 48, or even 24-line capacity RTs, thereby improving overall DLC  
18 utilization. Verizon's selection of a 224-line unit results in lower utilization and  
19 higher cost allocation. Verizon-Virginia's Litespan 2000 Planning Guidelines  
20 suggest using a 96 line unit that could significantly increase utilization for small  
21 line count areas. Moreover, there are a number of DLC products used in the  
22 industry that efficiently serve smaller line count areas. A typical small line size  
23 unit and its cost is included in Mr. Riolo's Direct Testimony.

1 **Q. IS THE UTILIZATION FACTOR OF 56.9% FOR “COMMON**  
2 **ELECTRONICS” CORRECT?**

3 A. No. Although there is no definitive way to adjust Verizon’s proposed utilization  
4 rate, it seems reasonable to adjust Verizon’s 56.9% estimate to 80% to take into  
5 account the mistaken assumptions that form the basis for Verizon’s estimate.

6 **5. CONDUIT UTILIZATION**

7 **Q. DOES VERIZON APPLY A UTILIZATION FACTOR TO ITS CONDUIT**  
8 **INVESTMENT?**

9 A. Yes. Verizon inappropriately applies a duct utilization factor to conduit  
10 investment developed within the LCAM.<sup>42</sup> The utilization factor used by Verizon  
11 is [BEGIN VERIZON PROPRIETARY] \*\*\* [END VERIZON  
12 PROPRIETARY] and is based on Verizon’s calculations of the ratio of conduit  
13 duct occupied to conduit duct available in its embedded network. Application of  
14 this embedded utilization factor overstates forward-looking costs.

15 **Q. WHY IS THE APPLICATION OF A CONDUIT DUCT UTILIZATION**  
16 **FACTOR INAPPROPRIATE?**

17 A. Verizon’s cost study substantially inflates the cost of conduit by using a  
18 completely unjustified duct utilization factor of [BEGIN VERIZON  
19 PROPRIETARY] \*\*\* [END VERIZON PROPRIETARY]. This factor fails to  
20 consider that so much spare conduit capacity is not needed in a forward-looking  
21 environment and that other assumptions within Verizon’s cost model also provide  
22 for spare capacity in the underground facility.

1           First, standard industry practice designates the reservation of only one  
2 spare maintenance duct for the entire conduit section. Should a cable failure  
3 occur in a conduit section with one spare maintenance duct, a new piece of cable  
4 can be pulled into the spare duct, working lines can be thrown into the new piece  
5 of cable, and the defective piece of cable can be removed to once again regain one  
6 maintenance spare duct. Verizon's utilization factor assumes much more than one  
7 spare duct is needed.

8           Second, Verizon's conduit costs already include spare innerducts,  
9 providing for additional spare capacity for fiber cable. Because every 4-inch  
10 conduit pipe can hold three or four fiber cables, frequently three or four innerducts  
11 are placed within a 4-inch conduit pipe between manholes, each of which can hold  
12 one fiber cable. Verizon's cost study assumes that every 4-inch conduit pipe has  
13 one spare innerduct for every two in use.<sup>43</sup> Because a typical duct contains three-  
14 to-four innerducts, each capable of accommodating a fiber cable, there is ample  
15 space for additional fiber if demand warrants – without the need for any spare  
16 ducts.

17           Third, the cables traversing the conduit already include a substantial  
18 allowance for spare capacity through the application of cable utilization factors  
19 discussed previously. To include additional conduit capacity in the unlikely event  
20 the cable capacity is exhausted overstates properly developed TELRIC costs.

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<sup>42</sup> 4.12 Loop Study Formulas.Doc.

<sup>43</sup> *Id.*

1           Fourth, the utilization of fiber in conduit can be improved to accommodate  
2 additional demand by upgrading the electronics at each end of the fiber strand  
3 without consuming additional conduit space. In other words, the throughput  
4 capacity of the fiber within the conduit can be improved through upgrading the  
5 multiplexers, without requiring additional conduit. Thus, Verizon has modeled  
6 excessive conduit capacity by applying its conduit fill factor.

7           Because conduit will not be built unless a foreseeable demand for it exists,  
8 at most, one spare maintenance duct is needed per conduit section. Rather than  
9 attempting to provide for such a spare through a utilization factor, we  
10 conservatively made two adjustments to Verizon's conduit utilization. First, we  
11 eliminated Verizon's application of a **[BEGIN VERIZON PROPRIETARY]**  
12 **\*\*\* [END VERIZON PROPRIETARY]** conduit utilization. Second, to be safe,  
13 we provided for an additional spare 4-inch duct for each foot of installed conduit  
14 by adding \$0.72 per foot to Verizon's conduit cost. The \$0.72 is the material cost  
15 per duct foot from the FCC's Synthesis Model. With these adjustments, the  
16 forward-looking conduit investment includes adequate capacity to serve  
17 anticipated demand.

18 **Q. ARE THERE OTHER PROBLEMS RELATING TO VERIZON'S**  
19 **DEVELOPMENT OF CONDUIT INVESTMENT?**

20 **A.** Yes. Verizon likely overstates the amount of underground plant in its network as  
21 compared to aerial or buried cable and thus likely overstates the amount of  
22 conduit needed. Verizon determines the overall cost of conduit by developing a  
23 unit cost and applying that cost to the number of conduit feet produced by the

1 UAAA Model. The UAAA assumptions relating to the mix of the outside plant  
2 structure among aerial, buried, and underground plant were based on a survey  
3 performed by Verizon engineers and were not carefully scrutinized in the UNE  
4 proceeding and thus were not reviewed by the Virginia SCC. Indeed, the LCAM  
5 model included with Verizon's 1997 study included over [BEGIN  
6 PROPRIETARY] \*\*\* [END PROPRIETARY] of the distribution plant as  
7 underground. Yet, in a recent hearing in New Jersey, Verizon witness Donald  
8 Albert explained that there is "very, very little" underground cable in the  
9 distribution portion of the plant.<sup>44</sup> This further suggests that Verizon's conduit  
10 investment figures are overstated. We have not attempted to adjust for this  
11 problem, however.

12 **E. EF&I FACTORS**

13 **Q. WHAT ARE EF&I FACTORS?**

14 **A.** EF&I stands for engineer, furnish and install and represents the costs associated  
15 with installing materials in the forward-looking network. Verizon includes EF&I  
16 costs in its forward-looking cost study based on its recent experience installing  
17 material in its embedded network.

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<sup>44</sup> New Jersey Board of Public Utilities Docket No. TO00060356; January 3, 2001 transcript of Marsha S. Prosini and Donald E. Albert at page 2162.

1 **Q. DOES VERIZON'S COST STUDY CORRECTLY APPLY FORWARD-**  
2 **LOOKING EF&I FACTORS?**

3 A. No. Verizon has made no attempt to establish that its historical experience is at  
4 all reflective of the EF&I costs likely to be needed in a forward-looking  
5 environment. In fact, because costs actually incurred by Verizon for EF&I  
6 investment often involve removal of older equipment along with costs for  
7 reconfiguring existing office space, the costs would not and could not reflect the  
8 forward-looking efficiencies of a new installation in a new building designed  
9 specifically for the equipment. We asked Verizon for details data underlying the  
10 loop electronics EF&I factors in an effort to evaluate Verizon's position. To date,  
11 Verizon has refused to provide the detailed data.

12 **Q. WHERE HAS VERIZON APPLIED EF&I LOADINGS IN ITS LOOP**  
13 **COSTS?**

14 A. Verizon applies EF&I loadings to its digital loop carrier equipment costs in its  
15 loop study. Verizon's DLC unit prices include a combination of prices, some of  
16 which already include EF&I costs and others that do not. None of the plug-in  
17 investment unit costs in the cost study already include an EF&I factor. Thus each  
18 piece of plug-in equipment investment is increased by **[BEGIN VERIZON**  
19 **PROPRIETARY] \*\*\* [END VERIZON PROPRIETARY]** for installation.  
20 That figure is computed by Verizon based on the ratio of 1998 actual total  
21 installed digital circuit equipment investment (both plug-in and hardwire) (FRC  
22 Account 257C) to digital circuit material investment (both plug-in and hardwire).  
23 By combining plug-in and hardwire equipment to develop its EF&I factor,  
24 Verizon masks the fact that the EF&I for plug-in equipment is minimal.

1 **Q. WHY IS THE FACT THAT THE PLUG-IN EQUIPMENT EF&I IS**  
2 **MINIMAL MATTER IN VERIZON’S COST STUDY?**

3 A. Installation of plug-in equipment is a simple matter of snapping the plug-in card  
4 into the appropriate slot. A more appropriate EF&I for plug-in equipment is the  
5 plug-in only factor from Verizon’s historical data. According to Verizon’s  
6 documents, this factor is **[Begin Verizon Proprietary] \*\*\* [End Verizon**  
7 **Proprietary]**. We have applied this factor to plug-in investment in our  
8 restatement of Verizon’s costs.

9 **F. STRUCTURE SHARING**

10 **Q. HOW DO UTILITIES TYPICALLY REDUCE THE COST OF**  
11 **STRUCTURE?**

12 A. Telephone networks typically include aerial cable that is attached to poles, buried  
13 cable that travels through trenches, and underground cable that travels through  
14 conduits. Because structure represents a significant portion of cost associated with  
15 constructing plant, engineers welcome the opportunity to participate in structure  
16 sharing arrangements.

17 **Q. DOES VERIZON’S COST STUDY PROPERLY REFLECT SAVINGS**  
18 **ASSOCIATED WITH SHARING OF STRUCTURE?**

19 A. No. Although Verizon’s cost study takes into account some sharing of poles,<sup>45</sup> it  
20 does not properly account for sharing of buried trenches or conduits. Verizon  
21 does not provide for any sharing of the buried trench facility and provides for only  
22 *de minimis* sharing of conduit.

1 **Q. IS VERIZON’S APPROACH TO SHARING OF BURIED TRENCHES**  
2 **REASONABLE?**

3 A. No. Verizon’s failure to account for any sharing of trenches is a significant  
4 omission. Such structure sharing arrangements yield significant cost savings.  
5 Joint buried agreements that set forth the terms and conditions for joint buried  
6 operations are common in the industry. Typically, the “lead” company (*e.g.*,  
7 power company) will notify the participating partners of its intent to open a trench  
8 on a certain date. Each of the partners will then ready its respective plant items  
9 for inclusion in the trench; and the “lead” company will handle the closing of the  
10 trench and any necessary restoration. The cost of the operation may be shared as a  
11 billed cost. It is reasonable to estimate that on average there will be at least 3-way  
12 sharing of the trench. Opportunities for joint buried operations include utilities  
13 (such as Power, Gas, CATV and Telco) and municipal services (Water,  
14 Fire/Police Communications). In new building construction, builders are usually  
15 amenable to burying Telco plant, provided the material is supplied in advance.  
16 When house services (*e.g.*, Water, Gas and Electric) are buried, the cable plant is  
17 placed in a common trench by the building contractor at no additional cost. It is  
18 therefore reasonable to conclude that the Verizon cost study should be adjusted to  
19 reflect the three-way sharing of the trenching operation associated with buried  
20 plant.

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<sup>45</sup> Verizon Cost Panel Testimony at 120.

1 **Q. IS VERIZON'S ASSUMPTION OF ONLY DE MINIMIS SHARING OF**  
2 **TRENCHES IN UNDERGROUND PLANT REASONABLE?**

3 A. No. Like buried plant, underground plant requires trenches but also includes  
4 conduit through which the cables run. While the conduit may not be shared, the  
5 trenches can be shared, just as they can for buried plant.

6           Underground structure is typically found in more densely populated areas.  
7 Municipal regulations generally discourage the indiscriminate opening of streets  
8 and sidewalks. Moreover, for safety reasons, it is not unusual for municipalities  
9 to prohibit street openings during holidays and inclement weather. Many local  
10 municipalities also require that opened streets must be completely repaved, rather  
11 than patched. As a result, when streets are opened, restoration costs can be quite  
12 high. For these and other reasons, companies look for structure-sharing  
13 opportunities. Certainly, the sharing of the trench into which conduits are placed  
14 is one such opportunity. Frequently, when roads are widened facilities are  
15 removed from the overhead pole line and placed underground. While the  
16 construction is in progress, the participants jointly share the open street for  
17 placement of conduits and manholes. Although the number of available partners  
18 for sharing trenches for underground plant is smaller than for buried plant, it is  
19 reasonable to conclude, at a minimum, that the cost of the trench itself can be  
20 shared by two partners. This would result in a 50% sharing factor adjustment to  
21 the Verizon cost study.

1 **Q. DID THE FCC INCLUDE ANY ADJUSTMENTS FOR SHARING OF**  
2 **TRENCHES IN ITS SYNTHESIS MODEL?**

3 A. Yes. The FCC, in developing the inputs to the Synthesis Model, recognizes that a  
4 firm entering the market today would take full advantage of structure-sharing  
5 opportunities. Overall, just as we have here, the Synthesis Model assumes that the  
6 new telephone entrant would bear 33% of the cost of the buried cable trench and  
7 50% of the underground conduit plant. The difference would be paid by other  
8 utilities with which the facilities would be shared.

9 **G. GROWTH**

10 **Q. DOES THE VERIZON MODEL PROPERLY HANDLE GROWTH?**

11 A. No. Although the Verizon cost study's input assumptions provide for a large  
12 amount of spare capacity in the forward-looking outside plant, Verizon's cost  
13 study fails to reflect that as this spare capacity is consumed by new customers in  
14 the future, the average cost per line will decline because the initial investment cost  
15 will be spread over more lines.

16 **Q. HAVE YOU CORRECTED VERIZON'S STUDY TO PROPERLY**  
17 **ACCOUNT FOR FUTURE ANTICIPATED GROWTH?**

18 A. Yes. The modifications we have made to Verizon's cost study inputs still provide  
19 for substantial spare capacity. Thus, unit costs will decrease with future growth.

20 As a result, we have included in our restatement of Verizon's cost studies a

21 **[BEGIN VERIZON PROPRIETARY] \*\*\* [END VERIZON**

22 **PROPRIETARY]** estimate of annual growth. This approximates the average

23 growth in the number of working lines Verizon has experienced in Virginia over

24 the last three years, based on the Loop Analysis Reporting and Tracking (LART)

1 information provided in discovery. It is also consistent with the average growth  
2 assumptions used by Verizon's outside plant engineers in projecting repair and  
3 maintenance expense savings to be produced by the replacement of cable  
4 facilities. We modified the VCost module of the cost studies to compute the  
5 present value of 5 years of growth at the forecasted rate. The method we used  
6 properly reflects that the cost per unit (i.e., line) will decrease as additional  
7 demand units materialize.

8 **H. FORWARD-LOOKING NETWORK ADJUSTMENT FACTOR**

9 **Q. WHAT IS THE FORWARD-LOOKING-TO-CURRENT FACTOR**  
10 **INCLUDED BY VERIZON IN ITS COST STUDY?**

11 A. The forward-looking-to-current ("FLC") adjustment is an adjustment factor  
12 proposed by Verizon to allegedly compensate for its method of calculating  
13 expenses which ostensibly reduces these expenses inappropriately in a forward-  
14 looking network. Because Verizon calculates expenses based on the ratio of  
15 investment to expenses, expenses will automatically be projected to decrease  
16 when investment decreases in a forward-looking network. Verizon therefore  
17 adjusts its expenses based on the relationship of forward-looking investment to  
18 embedded investment observed by Verizon in the recent New York proceeding.  
19 Verizon estimates that an FLC of 80% is needed to properly recover forward-  
20 looking expenses.<sup>46</sup>

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<sup>46</sup> See Panel Testimony at 75.

1 **Q. HOW IS THE FLC APPLIED IN VERIZON'S STUDY?**

2 A. Verizon multiplies its historical investments by 80% before computing its  
3 expense-to-investment ratios, thereby decreasing the investment base and  
4 increasing the resulting ratio. This, in turn, increases its forward-looking costs.

5 **Q. IS VERIZON'S FORWARD-LOOKING-TO-CURRENT FACTOR**  
6 **CONSISTENT WITH TELRIC PRINCIPLES?**

7 A. No. Verizon's forward-looking-to-current factor is a thinly veiled attempt to  
8 recoup the operating costs of its embedded, inefficient network. It should be  
9 rejected.

10 **Q. VERIZON ARGUES THAT SUCH AN ADJUSTMENT IS NECESSARY**  
11 **BECAUSE THE EXPENSE FACTORS ARE BASED ON CURRENT**  
12 **EXPENSE-TO-INVESTMENT RATIOS AND, ON THAT BASIS, LOWER**  
13 **TELRIC INVESTMENT LEVELS WILL EFFECTIVELY PRODUCE A**  
14 **WINDFALL REDUCTION IN EXPENSES. DO YOU AGREE?**

15 A. Absolutely not. Rather than remaining constant as Verizon suggests, expenses  
16 will decrease in a forward-looking network. This is so for two reasons. First,  
17 productivity is improving over time and Verizon does not take this into account.  
18 In other proceedings in which Verizon has introduced a FLC, it first adjusts  
19 embedded expenses to make them "forward-looking" by applying a productivity  
20 adjustment, absorbing inflation, and making certain other forward-looking  
21 adjustments. No such adjustments are made to expenses by Verizon in Virginia.  
22 Second, many of the embedded Verizon inefficiencies produced by labor-  
23 intensive efforts to use technologically obsolete equipment to serve increasing  
24 demand will not exist in the forward-looking environment. Moreover, as  
25 telephone technology improves and equipment becomes more sophisticated, it