COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

Investigation by the Department of Telecommunications and Energy on its own Motion into the Appropriate Pricing, based upon Total Element Long-Run Incremental Costs, for Unbundled Network Elements and Combinations of Unbundled Network Elements, and the Appropriate Avoided Cost Discount for Verizon New England, Inc. d/b/a Verizon Massachusetts' Resale Services in the Commonwealth of Massachusetts	D.T.E. 01-20

REBUTTAL TESTIMONY OF MICHAEL R. BARANOWSKI

ON BEHALF OF AT&T AND WORLDCOM

(Loops and OSS Costs)

July 18, 2001

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I INTRODUCTION

Q. MR. BARANOWSKI, PLEASE STATE YOUR FULL NAME AND BUSINESS ADDRESS.

A. My name is Michael R. Baranowski. I am Managing Director of FTI/Klick, Kent & Allen, Inc., a subsidiary of FTI Consulting, Inc. ("FTI/KKA"). FTI/KKA is an economic and financial consulting firm with offices at 66 Canal Center Plaza, Suite 670, Alexandria VA, 22314.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I received a Bachelor of Science degree in Accounting from Fairfield University in 1980.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. After graduation from Fairfield University, I joined the consulting firm of Wyer, Dick and Company in Livingston, New Jersey. Since that time, I have worked on cost analyses, including analyses of short-run and long-run marginal costs, short-run and long-run incremental costs, and stand-alone costs for a variety of industries. These studies often employ complex, computer-driven models that rely upon detailed engineering input data and sophisticated discounted cash flow techniques. The results of many of these studies have been submitted in administrative proceedings, in court, and in arbitrations. Since 1996, I

have been assisting AT&T and other CLECs in analyzing cost evidence submitted in various proceedings arising out of the Telecommunications Act of 1996.

Q. **WILL YOU BRIEFLY SUMMARIZE YOUR RECENT TELECOMMUNICATIONS EXPERIENCE THAT IS RELEVANT TO THIS PROCEEDING?**

A. The firm has presented forward-looking economic costs for unbundled network elements ("UNEs") in a number of jurisdictions including Colorado, the District of Columbia, Idaho, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Carolina, North Dakota, Oregon, South Dakota, Texas, Washington, and Wyoming. We have participated in Universal Service Fund proceedings in Alabama, Colorado, Florida, Georgia, Minnesota, Montana, New Mexico, North Carolina, South Carolina, and Washington. We have critiqued cost studies submitted by Bell Atlantic or Verizon in Delaware, the District of Columbia, Maryland, New York, New Jersey, Pennsylvania, Virginia, and West Virginia. We have critiqued cost studies presented by GTE in California, Iowa, Minnesota, Nebraska, New Mexico, Oregon, Texas and Washington, submitted testimony in Texas on Southwestern Bell's cost studies, and critiques of the Benchmark Cost Proxy Model ("BCPM") in numerous states. FTI/KKA also has had relevant experience in other "network industries," including the railroad, pipeline and trucking industries.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I was asked by AT&T and WorldCom to review and analyze the Unbundled Network Element ("UNE") cost studies presented by Verizon Massachusetts (“Verizon”) with its May 4, 2001 submission in this proceeding. While my analysis focuses primarily on those aspects of the study pertaining to the cost of the loop and related loop components, it also addresses factors and adjustments that Verizon has employed generally throughout its cost studies. I also address specifically Verizon’s proposed recurring charge for ongoing OSS cost.

This reply testimony demonstrates that Verizon's claimed loop and other UNE costs substantially exceed forward-looking economic costs and should be rejected. In summary, Verizon's cost claims fail to satisfy the TELRIC standard.

Although there has not been adequate time to correct all of the flaws inherent in Verizon's cost presentation, we have identified a number of major deficiencies and corrected them using Verizon's own study. After correcting the Verizon study where possible to eliminate costs that would not reasonably be incurred in a forward-looking network environment, the Verizon model produces UNE loop rates in many instances that are near those produced by the

HAI 5.2a-MA model filed in this proceeding by AT&T. Our restated rates reflect the progress we have made to date in analyzing the new Verizon cost models. Further analysis, including a detailed review of more recent Verizon discovery responses could result in the need for additional corrections that would further lower loop rates.

II VERIZON COST MODEL OVERVIEW

Q. BRIEFLY DESCRIBE THE VERIZON COST STUDY.

A. Verizon's MA's loop cost study is comprised of a series of computer applications bundled within an Oracle software based interface. Loop costs are processed through a loop cost analysis model ("LCAM"), which is comprised of a number of programming modules. A brief description of each module is set forth below.

Plant Characteristics Module: This module uses information from a survey conducted by Verizon engineers to produce average feeder and distribution loop lengths for each distribution area and typical cable sizes for each wire center. Verizon claims that cable material and labor cost inputs to the Plant Characteristics Module are based on a separate Verizon system named the Engineering Cost Record Information System ("ECRIS").

Electronics Module: The electronics module develops investment costs for Next Generation Digital Loop Carrier ("NGDLC") hardware and common equipment for transmission of the voice grade signal over fiber facilities. Fiber feeder facilities provisioned with NGDLC are placed when the total loop length exceeds certain thresholds. For Verizon's cost study, those thresholds are zero for the Metropolitan rate zone (i.e., all feeder is assumed to be fiber), 4,000 feet for the urban rate zone, 5,000 feet for the suburban rate zone and 10,000 feet for the rural rate zone.[1] Verizon has identified material costs, but rather than use ECRIS-based labor hour estimate, as it does in the Plant Characteristics Module, it uses a multiplier of material to calculate total installed investment.

Loop Study Module: This module reads and summarizes the results of the Plant Characteristics and Electronics modules to produce the loop investment by wire center. The loop study module then combines the loop investment for each wire center with annual cost factor outputs from the VCost model which are then weighted by working lines to produce monthly recurring loop rates.

[1] See Verizon Cost Study Section 5 – Study Inputs; Subsection 5.3 Thresholds.

Q. WHAT IS THE VCOST MODEL?

A. The VCost model is a spreadsheet based application developed by Verizon to produce annual cost factors ("ACF's") that are used to convert investments to annual costs. These annual costs are converted to monthly costs by dividing by 12.

Q. WHAT ACF's DOES VCOST PRODUCE?

A. VCost produces ACF's for depreciation, return on investment, income and property taxes, network operations expenses, support expenses and miscellaneous marketing and administrative expenses.

Q. PLEASE PROVIDE AN OVERVIEW OF THE ORGANIZATION OF THE VERIZON COMPUTERIZED STUDY MODELS AND MODULES.

A. The Verizon cost programs are controlled by an Oracle software interface that allows analysts to modify certain of the inputs and assumptions within each of the program modules. The interface is difficult and cumbersome to work with and, more importantly, the interface limits the ability of the analyst to trace the impact of input changes.

Q. CAN YOU PROVIDE AN EXAMPLE OF THE DIFFICULTIES ASSOCIATED WITH MAKING A CHANGE TO THE VERIZON MODELS?

A. Yes. The first problem is with the Oracle software itself. The interface was written in an earlier version of the

software that is no longer available. In order to acquire the correct version of the software, a copy of the current version of the software must first be purchased. Verizon must then be provided with proof of purchase and license information, after which it sends a copy of the older version of Oracle that allows the user to properly run the program. This process is time consuming and, in at least one instance, required inquiries to Verizon's technical support personnel.

Q. ARE THE SOFTWARE VERSION ISSUES THE ONLY DIFFICULTIES YOU EXPERIENCED WITH RUNNING THE MODELS?

A. No. After the models are installed and functioning, an investment in time is needed to understand how the models interact within the interface and what inputs and assumptions drive the model results. Unlike a standard spreadsheet application which allows a user to simply highlight a cell and observe a specific formula, the Oracle interface for LCAM displays formulas for specially defined variables within the program. In order to review a formula, the user must first locate the program variable name assigned to that component and then search for the formula. In most cases, the formulas themselves also

include defined variable names, making tracing through the programs a time consuming endeavor.[2]

In addition, while the model allows the user to edit formulas or to create new formulas within the individual modules, it has to be done through a special process within the interface. This process is time consuming and cumbersome, especially when multiple formulas are edited. Finally, the model takes a long time to run and it is difficult (if not impossible) to debug if an input change produces an unexpected result.

Q. HAVE THE DIFFICULTIES THAT YOU ENCOUNTERED HINDERED YOUR ABILITY TO EFFECTIVELY EVALUATE THE MODEL?

A. Yes. The time spent understanding the mechanics of the model could have been better spent reviewing and analyzing the supporting input documentation produced by Verizon. Also, the cumbersome process of editing formulas combined with an inability to readily modify multiple formulas simultaneously makes evaluating the model more difficult.

[2] Further complicating the process, the Oracle interface restricts the users ability to review multiple formulas simultaneously, making it more difficult to understand the flow of information throughout the process.

III VERIZON's LOOP COSTS

Q. FOR WHICH TYPES OF LOOPS DOES VERIZON COMPUTE COSTS?

A. The loop cost model is used by Verizon to compute costs for several different types of loops as described in the Verizon Panel testimony.[3] They are as follows:

- Two- and four-wire analog loops and two-wire digital loops;
- Four-wire digital (DDS) loops;
- Four-wire digital (DS1) loops;
- ADSL-compatible loops, two-wire HDSL-compatible loops, and four-wire HDSL compatible loops;
- Conditioning charges for DSL-compatible loops;
- Line sharing;
- High-capacity (DS3 and above loops);
- House and riser and other “subloops”; and
- Dark fiber loops.

Q. DOES YOUR ANALYSIS FOCUS ON ALL OF THE VARIOUS LOOP COSTS COMPUTED BY VERIZON?

A. No. My analysis focuses primarily on Verizon’s calculations of its two-wire loop costs. However, the criticisms I raise in the remainder of this testimony are equally applicable to Verizon’s other loop cost calculations. I recommend that Verizon be directed to make

[3] Verizon Direct panel testimony at 65.

the same changes to its other loop cost calculations, so that the Department can see the extent to which the problems I have identified improperly inflate all of the loop rates proposed here by Verizon.

Engineering Survey

Q. PLEASE DESCRIBE VERIZON'S LOOP ENGINEERING SURVEY.

A. VERIZON develops its claimed loop costs based on a sample survey conducted specifically for this proceeding. According to the panel testimony, all central offices ("CO's") with more than 25,000 assigned lines were included in this sample. In addition, CO's with less than 25,000 assigned lines were separated into two groups – those with 5,000 to 24,999 assigned lines and those with less than 5,000 assigned lines. For those CO's with 5,000 to 24,999 lines, which Verizon labeled Group 1, 50 of 139 CO's were randomly sampled. For those CO's with less than 5,000 lines, which Verizon labeled Group 2, 23 of 67 CO's were randomly sampled. The results of these samples were fed to the Verizon Plant Characteristics program module.

Q. HAVE YOU REVIEWED THE SURVEY PARAMETERS?

A. Yes.

Q. DO THE VERIZON SURVEY AND CORRESPONDING SURVEY RESULTS FORM THE PROPER BASIS FOR A FORWARD-LOOKING COST STUDY?

A. No. Rather than define an efficient forward-looking network, the survey relies primarily on Verizon's own information on its embedded network. The following excerpt from the engineering survey instructions provided to the survey engineers received in response to discovery requests confirms that much of the survey data was extracted from Verizon's records and formatted for use in the survey. The role of the surveyors was to "inspect the local engineering records to verify these data."

> The Detail Data tab includes an extract from the LART system, containing a list of all Distribution Areas in the wire center. For each DA, the Feeder Distance (FEED_KF), which combines our categories of Feeder and Sub-feeder, the Total Loop Length (DIST_KF), and the working and available pairs have been extracted.
>
> In advance of distributing the model, we have estimated the CUM and LENGTH values based on the following assumptions. If the CSA has only one DA, CUM is set to FEED_KF and LENGTH is set to 0. If the CSA has more than one DA, CUM (for all the DAs) is set to the smallest value of FEED_KF among those DAs. For the closest DA, LENGTH is set to 0. For the remaining DAs, LENGTH is set to that DA's own FEED_KF less the value of CUM. (This assumption was made because we do not have the detailed data which would identify a more efficient arrangement, e.g., the positions of the DAs with respect to each other.)
>
> The surveyor will inspect the local engineering records to verify these data. In CSAs where an RT currently exists, the RT may not be at the closest DA to the C.O., but at one further out. In this case, CUM should be set to the RT location, and the backfeed

> distance in LENGTH. In CSAs where the planner has identified a location, that location will supersede our estimate.
>
> Three values must be added to the detail records for each DA: **PCSA, STRF and STRD.** PCSA is the prior CSA along the route from the current CSA to the C.O. By building a chain of CSA – PCSA, our model identifies the feeder branching so that cross-section fills may be determined mechanically. The entry is the CSA number of the prior CSA, not the number of links en route. When the CSA is fed directly from the C.O., enter "CO" instead of a number.[4]

Q. WHY DOES IT MATTER THAT VERIZON HAS BASED ITS LOOP COST STUDY ON LOOP LENGTH INFORMATION FROM ITS EMBEDDED NETWORK?

A. Basing a loop cost study on embedded base information violates TELRIC principles, and just does not make sense in constructing a least-cost network configuration that an efficient, competitive company would build today. For example, engineers typically construct underground conduit systems along no-cost public rights of way adjacent to, or within roadway rights of way. If a large tract of land was undeveloped 25 years ago, when Verizon engineered its feeder route, it might have placed conduit around the perimeter of the large tract of land. Today, roadways lace that tract of land, and an efficient company would place conduit using the shortest distance – along the roadways that cross the tract.

Q. ARE THERE OTHER ASPECTS OF THE SURVEY THAT YOU FIND TO BE TROUBLING?

A. Yes. In addition to replicating the embedded Verizon network, the survey instructions require the survey engineer to add records for the purportedly "predominant" structure in the feeder and in the distribution for each distribution area reviewed by Verizon. The survey instructions define these variables as follows:

> **STRF** is the predominant feeder structure in the segment between the CSA and PCSA. Predominance is based on length. For example, if the feeder segment includes 800 feet of underground cable and 200 feet of buried, the predominant structure is underground. The valid values for STRF are A (Aerial), B (Buried), and U (Underground).[5]
>
> **STRD** is the predominant distribution structure. It may be the existing structure if that is anticipated to continue through the next several years. Do not anticipate changes for which there is no specific plan, e.g., do not convert an aerial DA to buried because of substantial vacant land unless construction plans for that area are reasonably firm. Valid values for STRD are A (Aerial), B (Buried), U (Underground), K (Block) and R (House & Riser).

As these instructions make clear, both the feeder and distribution outside plant structure are based on the structure in existence today, with no effort made to define the efficient, forward-looking structure.

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[4] Verizon response to discovery request ATT-VZ 14-31, file ATT 14-31 OSP Svy Defn.doc

[5] Id.

Q. WERE YOU ABLE TO REVIEW THE DOCUMENTS UNDERLYING THE SURVEY TO DETERMINE IF THE ROUTE CONFIGURATION CAPTURED BY THE SURVEY IS, IN FACT, THE MOST EFFICIENT ROUTE?

A. No. We asked Verizon in discovery to provide copies of all materials (plat, network diagrams, demand forecasts, engineering guidelines and maps) reviewed or relied upon by the survey engineers. Verizon refused to provide the requested information.[6] We were thus unable to determine if the route configuration included in the survey data represents the most efficient, forward-looking routing. Verizon has offered no evidence whatsoever that the loop lengths and amount of outside plant that underlie its cost study reflect an efficient, forward-looking network.

Q. IN ADDITION TO THE SURVEY DATA, WHAT ARE THE SOURCES OF INFORMATION USED IN VERIZON'S LOOP COST MODEL?

A. Most of the sources are Verizon’s own internal information. Verizon did not provide documentation to support many of these inputs, hindering our ability to evaluate any efficiencies in the forward-looking network design. In response to AT&T and Worldcom discovery requests, Verizon provided some additional supporting information, but refused to provide supporting materials for a number of key inputs. These include details of the types of

installations of hardwire and plug-in electronics,[7] information relating to distribution areas that are forecasted to exhaust in the near future[8] and explanations of the reasons behind recent reinforcements of distribution plant.[9]

DS1 v. DS0 Interface

Q. VERIZON'S COST STUDY ASSUMES A MIX OF INTEGRATED DIGITAL LOOP CARRIER AND UNIVERSAL DIGITAL LOOP CARRIER INTERFACES FOR THOSE LOOPS WITH FIBER FEEDER. IS THIS THE APPROPRIATE FORWARD-LOOKING CONSTRUCT?

A. No. TELRIC requires that Verizon's forward-looking economic costs provide UNEs based upon a least cost, forward-looking network. In this case, least cost, forward-looking technology means an Integrated DLC interface at the DS1 level for those loops exceeding the fiber/copper threshold and provisioned with fiber feeder with the CLEC receiving the benefit of the technological efficiencies that are available today. It does not mean deploying less efficient analog Universal DLC interfaces

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[6] See Verizon response to discovery request ATT14-32.

[7] See Verizon responses to discovery requests ATT14-10 and ATT14-11.

[8] See Verizon response to discovery request ATT14-6.

and penalizing CLECs for connecting to Verizon's outdated "embedded" infrastructure. An Integrated DLC system performs one analog-to-digital ("A/D") conversion of the circuit at the line card in the DLC Remote Terminal in the field. Once digitized, the signal traverses the telecommunications network in a pure digital format. Verizon's proposal of a Universal DLC system means doubling the cost of line cards, plus adding an analog line card to the digital switch – in effect, three A/D conversions. With Universal DLC, the circuit undergoes (1) analog-to-digital conversion at the DLC Remote Terminal in the field, (2) undergoes digital-back-to-analog conversion in the DLC Central Office Terminal, is routed via MDF cross connections, and (3) then undergoes analog-back-to-digital conversion as it enters the digital switch. Such a configuration is cumbersome, inefficient, less reliable, and much more costly. Whether Verizon has antiquated technology in the embedded base or not, the costing principles of TELRIC dictate that prices should be based on the much more efficient Integrated DLC circuit layout.

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[9] See Verizon responses to discovery requests ATT14-40, ATT14-41, ATT14-42 and ATT14-43.

Q. WHAT ASSUMPTIONS DOES THE VERIZON STUDY MAKE REGARDING DIGITAL LOOP CARRIER INTERFACE?

A. Verizon's two-wire loop costs are based on Next Generation Digital Loop Carrier systems operating under GR-303 standards, but then it inappropriately increases costs by assuming a mix of forward-looking efficient integrated DLC interfaces along with more costly and less efficient universal DLC interfaces. Specifically, Universal DLC is weighted 68.75% while Integrated DLC is weighted a mere 31.25% in Verizon's loop costs.[10] By including the added costs of the less efficient universal DLC interface, Verizon overstates costs.

This breakdown is unusual, given Verizon's admitted statement:

> Fiber-fed DLC switched services are provisioned using an integrated DLC in the forward looking model. Other services require a universal interface, such as individual 2-wire analog loops or data services like ISDN and DDS.[11]

Q. CAN EFFICIENT, INTEGRATED DLC LOOPS BE HANDED OFF TO CLECS?

A. Yes. Such loops are handed off to CLECs via a DS1 interface.

The COT {Central Office Terminal} can provide an interface to local switching

[10] See Electronic Workpaper MA 01-20 Loop Sum.xls, in Subfolder Part B-1 Unbundled Loops.

[11] Verizon Panel Testimony at 75.

> equipment or other transmission systems (for example, those systems providing interconnection to another carrier's network) either (a) in a standard, 24 DS0-line digital format (known as "Integrated Digital Loop Carrier" [IDLC], or DS1 connection) or (b) as an individual analog channel (after decoding and demultiplexing) connected to copper wire interfaces (known as "Universal Digital Loop Carrier" [UDLC]).[12]

The issue is the type of tie cable arrangement that a CLEC makes via collocation in the central office. Efficient connection would be at the DS1 level via a tie cable from the DSX frame to the CLEC Point of Presence, rather that at the DS0 level from the MDF to the CLEC Point of Presence. It is inappropriate to use a very heavy weighting of UDLC and then force all carriers, both large and small, to pay for a large allocation of UDLC systems as part of recurring costs. TELRIC requires that the costs assume an IDLC configuration without degrading the circuit with two unnecessary A/D conversions and extra, unnecessary cross connections.

Q. ARE THERE OTHER PROBLEMS WITH VERIZON'S CALCULATION OF LOOP COSTS?

A. Yes. As we mentioned previously, there are numerous other flaws in Verizon’s study, all of which overstate its

[12] Verizon Direct Panel Testimony at 74.

model's output results creating inflated claimed loop costs. These problems range in scope from utilization factors that are too low to what appear to be arbitrary adjustments for “forward-looking” expense adjustment factors.

Utilization Factors

Q. DID VERIZON USE THE CORRECT FORWARD-LOOKING UTILIZATION FACTORS IN ITS DEVELOPMENT OF CLAIMED UNE COSTS?

A. No. The utilization factors employed by Verizon in its UNE cost models are far too low and therefore overstate costs considerably.

Q. WHAT UTILIZATION FACTOR DID VERIZON USE FOR DISTRIBUTION CABLE?

A. Verizon used a 40% factor for distribution cable fill that was based upon a “bottom-up” analysis that purports to support that factor. See Verizon Panel Testimony at 78 – 83.

Q. DO YOU AGREE WITH VERIZON’S “BOTTOM-UP” DEVELOPMENT OF ITS PROPOSED DISTRIBUTION FILL FACTOR?

A. No. Verizon's "analysis" is without merit. In fact, in order to arrive at a result that approximates 40%, Verizon made a number of self-serving assumptions that fly in the face of TELRIC costing principles.

Q. PLEASE EXPLAIN HOW VERIZON TRIES TO SUPPORT ITS PROPOSED 40% DISTRIBUTION FILL FACTOR.

A. As Verizon's panel testimony explains, it starts with two distribution cable pairs for every zoned residential unit. Verizon adjusts this utilization to reflect actual demand that today is close to 1.2 lines per living unit. Thus, Verizon concedes that on average its distribution plant should be working at 60% (1.2 lines ÷ 2.0 lines of capacity = 60%). Verizon then makes a series of seemingly arbitrary adjustments designed to reduce substantially the distribution utilization level. First Verizon claims that a 10% "growth adjustment" is needed to ensure that distribution pairs are available to serve unsupported speculative prospective development on vacant parcels of land somewhere throughout its service territory. Second, Verizon argues that a reduction of 5% is necessary to reflect "churn" (household and business vacancies at any particular point in time). Third, Verizon argues that a further 10% "negative growth" reduction in utilization is warranted for customers lost to competitive alternatives. As will be discussed later, Verizon has changed the minus sign ("negative growth") to a plus sign ("positive growth") such that what should be a justification for higher fill factors becomes a Verizon justification for lower fill

factors. Combined, Verizon argues that these factors contribute to an overall reduction in distribution utilization of 25% from the 60% start-point (0.5 x 1.6 = 60% x .75 = 45%). Stated differently, Verizon claims that on average, only 75% of the zoned living units in an average distribution area ("DA") will be generating Verizon demand in a forward-looking scenario. Finally, Verizon claims that distribution utilization levels must be reduced even further to take breakage into account. Verizon estimates breakage is responsible for an additional 10% reduction in distribution utilization in a forward-looking environment. Based on the foregoing "analysis" which, according to Verizon justifies a distribution utilization level of 40.5% (.5 x 1.2 x .75 x .9 = 40.5%), Verizon concludes its use of a 40% utilization factor is reasonable.

Q. WHY DO YOU DISAGREE WITH VERIZON'S DISTRIBUTION UTILIZATION FACTOR DEVELOPMENT?

First, by starting with cable sized for two lines per zoned residential household, Verizon has even ignored the actual growth and service characteristics of its embedded distribution areas. Under TELRIC, Verizon must tailor distribution levels to the specific service and growth characteristics of each of the distribution areas (DAs)

studied. Cable is placed in new neighborhoods, and then utilization increases over time. Utilization levels in mature neighborhoods, where line counts have remained stable for many years, would be much higher than in other areas. Second, at least two of the adjustments Verizon makes to ultimate demand are inconsistent with TELRIC principles.

Q. WHICH VERIZON ADJUSTMENTS CONFLICT WITH THE TELRIC STANDARD?

A. Both the 10% adjustment for undeveloped parcels and the 10% adjustment for customers lost to competitors violate TELRIC.

First, for the undeveloped parcels, by assuming reduced utilization at the beginning of the analysis and not making subsequent adjustments, Verizon implicitly assumes that the spare for undeveloped parcels will remain forever. Under this approach, revenues from these parcels will never be available to defray the investment in spare placed solely for their benefit. Moreover, Verizon has not established that these parcels are likely to be developed within the projected life of the outside plant spare. In effect, Verizon is providing spare capacity designed to be available to serve additional demand created when undeveloped parcels are ultimately developed, but

makes no offsetting adjustment to reflect that the overall cost per working line will decline as that excess plant is converted from “spare” to “revenue producing” once the demand materializes.

In it's USF Inputs order[13], the FCC addresses this issue:

> 56. In adopting the PNR approach for developing customer location counts, we note that the synthesis model currently calculates the average cost per line by dividing the total cost of serving customer locations by the current number of lines. Because the current number of lines is used in this average cost calculation, we agree with AT&T and MCI that the total cost should be determined by using the current number of customer locations. As AT&T and MCI note, "the key issue is the consistency of the numerator and denominator" in the average cost calculation. According to AT&T and MCI, other proposed approaches result in inconsistency because they use the highest possible cost in the numerator and divide by the lowest possible number of lines in the denominator, and therefore result in larger than necessary support levels. AT&T and MCI also assert that, in order to be consistent, housing units must be used in the determination of total lines if they are used in the determination of total costs. MCI points out that "[i]f used consistently in this manner, building to housing units as GTE proposes is unlikely to make any difference in cost per line." Although SBC advocates the use of housing units, it agrees that the number of lines resulting from this approach should also be used in the denominator of any cost per line

[13] In the Matter of Federal-State Joint Board on Universal Service, CC Docket 96-45, and Forward Looking Mechanism for High Cost Support for Non-rural LECs, CC Docket 97-160, Tenth Report and Order, No. FCC 99-304, Released November 2, 1999.

calculation to prevent the distortion noted by AT&T and MCI. We agree with AT&T and MCI that, as long as there is consistency in the development of total lines and total cost, it makes little difference whether households or housing units are used in determining cost per line. For the reasons discussed below, we believe that PNR's methodology based on households is less complex and more consistent with a forward-looking methodology than housing units.

57. To the extent that the PNR methodology includes the cost of providing service to all currently served households, we conclude that this is consistent with a forward-looking cost model, which is designed to estimate the cost of serving current demand. As noted by AT&T and MCI, adopting housing units as the standard would inflate the cost per line by using the highest possible numerator (all occupied and unoccupied housing units) and dividing by the lowest possible denominator (the number of customers with telephones).

58. If we were to calculate the cost of a network that would serve all potential customers, it would not be consistent to calculate the cost per line by using current demand. In other words, it would not be consistent to estimate the cost per line by dividing the total cost of serving all potential customers by the number of lines currently served.

Second, for spare capacity that Verizon alleges will become available because of customers lost to competitors, Verizon’s approach fails to consider that until the time customers are lost, they will contribute revenues to defray the initial investment. Further, if Verizon truly believes that a significant amount of customers will be lost to

competitors then, as I discuss in more detail below, Verizon forward-looking design starting point of provisioning for two lines per living unit clearly overstates the amount of forward-looking plant necessary.

Finally, and most perversely, Verizon has created two adjustments for distribution utilization that in reality will neutralize each other. This is so because as customers are lost to competitors, facilities will become available to serve new customer demand. In other words, as customers depart the Verizon network, what was once working revenue producing plant becomes idle and available for deployment to serve new customer demand. Consequently, because these VERIZON adjustments conflict with TELRIC and are otherwise not justified, we have eliminated them in my restatement of distribution utilization factors.

Q. DID YOU MAKE ANY OTHER ADJUSTMENTS TO VERIZON'S DISTRIBUTION UTILIZATION?

A. Yes. Although I have many disagreements as to the appropriateness of much of Verizon's cost model, I have attempted to focus on the most significant issues. As I discussed earlier, Verizon's alleged "rule-of-thumb" two lines per each zoned residential unit as the starting point for its bottoms-up analysis is not the right starting point

for a TELRIC analysis designed to serve all of Verizon's existing demand. This is because blind reliance on such a rule-of-thumb ignores completely the fact that Verizon has in its possession historical information that will permit a more refined approach to developing appropriate forward-looking fill levels that take into account the historical growth patterns within specific service territories in Massachusetts. With this information, Verizon can tailor specific design criteria that would ensure excess outside plant capacity is not placed in those areas where additional demand will never be achieved. Indeed, Verizon's acknowledgement of only 20% second line penetration is a clear indication that providing a minimum of two lines for everyone overstates the amount of outside plant needed.

Q. WHAT FORWARD-LOOKING DESIGN STARTING POINT SHOULD BE USED FOR DISTRIBUTION FILL?

A. Taking into consideration that, despite allegedly employing the a practice of building two lines per living unit, Verizon has only achieved an average of 20% second line penetration. I believe that the correct forward-looking design starting point for distribution fill is a more modest assumption of 1.6 lines per living unit. Adjusting this to include the appropriate forward—looking adjustment

from Verizon's own bottom-up analysis (i.e., 1.2 current lines per living unit, 5 percent "churn" in vacant occupancy rates and 10 percent for breakage) yields a forward-looking distribution fill factor of 64.1 percent. Table 1 sets forth my calculation.

Table 1
Development of Forward-Looking
Distribution Fill Factor

Description	Source	Value
1. 1.6 Lines per Living Unit Design Criteria	(1 / 1.6)	0.625
2. Current Lines Per Living Unit	Verizon	1.2
3. Starting Fill	Line 1 x 2	0.75
4. Churn (Vacancy) Adjustment	Verizon	0.95
5. Fill	Line 3 x 4	0.7125
6. Breakage Adjustment	Verizon	0.90
7. Effective Fill	Line 5 x 6	0.64125

Q. DO YOU HAVE ANY ACTUAL INFORMATION FROM VERIZON TO SUPPORT YOUR PROPOSED DISTRIBUTION FILL?

A. Yes. In response to discovery request ATT14-41, Verizon provided detailed information from its engineering survey results. This information, produced in the file ATT 14-31 MA1299LART.xls shows the number of working lines and available lines for each distribution area ("DA") included in the Verizon engineering survey. That data shows that

the average ratio of working lines to available lines weighted by the length of distribution in each DA is 60%.[14]

Q. DID VERIZON USE THE CORRECT FORWARD-LOOKING COPPER AND FIBER FEEDER FILL FACTORS?

A. No. For copper feeder, Verizon uses a 55.2% fill factor. For fiber feeder, Verizon uses a 60% fill factor. See Panel Testimony at 83. Both of these factors are far too low for use in a forward-looking cost study. As John Donovan explains in his rebuttal testimony, since copper feeder cable is engineered to be reinforced on a 3 to 5 year basis, the appropriate forward-looking fill factor for copper feeder is 80 percent. For fiber cable, the allocation of 2 extra fibers to each DLC Remote Terminal (2 “service” plus 2 “protect”) supports a fill factor for fiber feeder of 100 percent. I have used Mr. Donovan’s recommendations in my restatement.

Q. DID YOU MAKE ADJUSTMENTS TO OTHER UTILIZATION FACTORS IN THE VERIZON MODEL?

A. Yes. I changed the utilization rate for RT plug-in electronics from the 80% used by Verizon[15] to a more realistic forward-looking estimate of 90%.

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[14] See file ATT14-31 MA 1299LART Dist Fill Support.xls in Loop Study Adjustment Folder.

[15] See Verizon Direct Panel Testimony at 84.

Q. ON WHAT BASIS DID YOU MAKE THAT ADJUSTMENT?

A. The adjustment was made based on the fact that plug-in equipment capacity, unlike other components of the outside plant facility, is readily expandable. As Mr. Donovan explains in his rebuttal testimony, lightweight, easily transportable and installable plug-ins are installed on a regular basis to handle 6-month's worth of growth. At 3% per year growth, this would amount to justification for a 98.5% fill factor, so we believe that 90% is a conservative number.

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

A. Yes. Verizon inappropriately applies a duct utilization factor to conduit investment developed within the LCAM.[16]

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

A. The application of an additional duct utilization factor is inappropriate for a number of reasons. Verizon's cost study inflates the cost of conduit substantially by using a completely unjustified utilization factor of 44.44% (66.7% x 66.7%). First, Verizon assumes that there is a spare 4-inch conduit pipe between manholes for every two 4-inch

[16] See Verizon Cost Study, Section 5 Study Inputs, Subsection 5.2 Study Factors page 3 of 4

conduit pipes in use. This flies in the face of standard industry practice that designates the reservation of one spare maintenance duct per entire conduit section, such that should a cable failure occur in a conduit section, a new piece of cable can be pulled into the spare maintenance duct, working lines can be thrown into the new piece of cable, and the defective piece of cable can be removed to once again regain one maintenance spare duct. Second, Verizon's cost study allocates far too many spare fiber innerducts. Frequently, either three or four innerducts are placed within a 4-inch conduit pipe between manholes to facilitate the periodic placement of several fiber cables within one 4-inch conduit pipe. Verizon's cost study assumes that every 4-inch conduit pipe has one spare innerduct for every two in use.[17] Because a typical duct contains three to four innerducts each capable of accommodating a fiber sheath, there is ample space for additional fiber sheaths if demand warrants with an allocation of one spare innerduct for an entire conduit section. Third, the cables traversing the conduit themselves already include a substantial allowance for spare capacity through the application of cable utilization factors discussed previously. To add additional conduit

[17] Id.

capacity in the unlikely event the cable capacity is exhausted overstates properly developed TELRIC costs. Fourth, the utilization of fiber in conduit can be improved to accommodate additional demand by upgrading the electronics at each end of the fiber strand without consuming additional conduit space. In other words, the throughput capacity of the fiber within the conduit can be improved through upgrading the multiplexers without placing additional conduit. For these reasons, I have set the conduit duct utilization factor in my restatement of the Verizon cost study to one (i.e., to 100 percent).

Q. IS THERE ANY PRECEDENT FOR YOUR ADJUSTMENT TO THE CONDUIT DUCT UTILIZATION?

A. Yes. The ALJ in his Recommended Decision in New York agreed with the reasonable allegation raised by AT&T that the methodology used by Verizon to develop conduit investment included overlapping fill factors.[18] The method used by Verizon in New York upon which the ALJ commented was virtually identical to the method Verizon employs here.

[18] See State of New York Public Service Commission, Case 98-C-1357, Recommended Decision on Module 3 Issues at 120.

Q. ARE THERE OTHER IMPLICATIONS RELATING TO VERIZON'S DEVELOPMENT OF CONDUIT INVESTMENT?

A. Yes. Verizon develops conduit investments by applying a unit cost to the number of conduit feet produced by the by the Plant Characteristics Module of the Loop Cost Study, which in turn processes information from the Verizon engineering survey. I could not carefully scrutinize any details of the survey assumptions relating to the mix of the outside plant structure among aerial, buried and underground plant because Verizon refused to provide many of the supporting materials.

The Verizon Massachusetts loop cost model assumes ten percent of the distribution plant as underground. In a recent hearing in New Jersey, Verizon witness Donald Albert explained that there is typically "very, very little" underground cable in the distribution portion of the plant.[19] This casts further doubt on Verizon's assumptions regarding conduit investment and the validity of its survey methodology.

[19] New Jersey Board of Public Utilities Docket No. TO00060356; January 3, 2001 transcript of Marsha S. Prosini and Donald E. Albert at page 2162.

Growth

Q. DOES THE VERIZON MODEL PROPERLY HANDLE GROWTH?

A. No. Verizon's engineering survey instructions explicitly state:

> A forward-looking analysis should consider existing placements which conform to the guidelines, current construction plans, and an extrapolation of these plans to the long run. In extrapolating to the long run consider the provision of the current level of demand, utilizing forward-looking engineering guidelines and technologies, over the next several capacity additions.[20]

Thus, while it is clear that the survey instructions require sizing of the outside plant facility to meet current requirements as well as expected growth for a period, Verizon fails to spread the costs of this additional demand over the anticipated increased demand. This basically means that today’s customers are forced to bear the cost for facilities they will never use.

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

A. Yes. I have included in my restatement of Verizon’s cost studies an estimate of 3% annual growth. This represents the approximate average total line growth Verizon has experienced in Massachusetts over the last five years as reported in ARMIS. I modified the VCost module of the cost

studies to compute the present value of 10 years of growth at the forecasted rate. The method I used properly reflects that the cost per unit (i.e., line) will decrease as additional demand units materialize. This adjustment for future demand is consistent with the demand growth adjustment recently recommended by Judge Linsider in New York.[21]

Forward-Looking Network Adjustment Factor

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

A. The forward-looking-to-current ("FLC") adjustment is an adjustment factor proposed by Verizon to allegedly compensate for reductions in forward-looking expenses resulting from the use of expense to investment ratios as a means of projecting forward-looking expenses. Verizon contends that because forward-looking investments are typically lower than its embedded investment levels, use of expense to investment ratios result in a windfall to CLEC's. Based on the relationship of forward-looking investment to embedded investment observed by Verizon in the recent New York proceeding, it estimates a FLC of 80%

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[20] Verizon response to discovery request ATT-VZ 14-31, file ATT 14-31 OSP Svy Defn.doc

[21] See State of New York Public Service Commission, Case 98-C-1357, Recommended Decision on Module 3 Issues at 100.

is needed for it to properly recover forward-looking expenses. See Panel Testimony at 54 – 62.

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

A. Verizon applies the FLC used in the development of the expense to investment ratio by dividing its historical operating expenses by 80%, thereby increasing the expenses and the resulting ratio. This, in turn, increases its forward-looking costs.

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

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

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

A. Absolutely not. Verizon is only looking at one side of the coin. TELRIC envisions a new least cost, efficient, forward-looking technology-based network built today to serve current demand. Many of the embedded Verizon inefficiencies produced by labor intensive efforts to use technologically obsolete equipment to serve increasing

demand will not exist in the forward-looking environment. Moreover, as telephone technology improves and the equipment becomes more sophisticated, it also becomes less labor intensive and more “user friendly” to operate and maintain. In contrast to Verizon's embedded cost approach, these facts actually support a forward-looking network adjustment factor that reduces forward-looking operating expenses, not increasing as Verizon proposes.

Q. **ARE THERE OTHER PROBLEMS WITH VERIZON’S PROPOSED FLC?**

A. Yes, there are a number of problems. First, Verizon claims that the use of ACFs by the Company to reflect the expense of providing UNEs results in purchasers of UNEs realizing expense savings that have not been identified or ascribed to any particular actual cost-cutting initiative of the Company. Verizon attributes these alleged savings to a TELRIC construct which generally results in reduced levels of investment compared with the embedded investment used to produce the ACF ratios. What is missing from Verizon’s discussion is an acknowledgement that in addition to TELRIC investment being generally lower than the investment in the existing network, the mix of assets is also different. The forward-looking TELRIC construct allows for the construction of an all-new facility using the most efficient assets available. Typically, more efficient assets are those that

are less expensive to operate and maintain, which will, in turn, result in lower overall expenses.

Q. CAN YOU PROVIDE AN EXAMPLE OF A SHIFT IN THE ASSET MIX THAT WILL RESULT IN LOWER OVERALL FROWARD-LOOKING EXPENSES ABSENT ANY DIRECT LINK TO VERIZON COST CUTTING INITIATIVES?

A. Yes. The shift in the forward-looking network to more fiber in the feeder facility is a perfect example. The Verizon cost study assumes that fiber will be used in place of copper in the forward-looking feeder network beyond certain thresholds. Because of this assumption, there are more fiber based feeder facilities in the forward-looking network than in the embedded network. In addition to being less expensive on a per circuit basis than most copper cable, the cost of maintaining fiber is far less costly than the cost of maintaining copper cable. This is evidenced by Verizon's own cost study which shows a aerial fiber cable network expense ratio of 0.0305 while the ratio for aerial metallic cable is 0.1654.[22] Table 2 below demonstrates that even is one assumes fiber cable investment costs to be equal to copper cable investment costs, the forward-looking network would enjoy lower expenses then the embedded network.

[22] See Verizon Cost Study Section 5.13 – Annual Cost Factors.

Table 2
Demonstration of Expense Reductions Resulting
From Use of More Efficient Forward-Looking Assets

Item	Embedded Network	Forward-Looking Network
Copper Feeder Investment	$1,000	xxx
Fiber Feeder Investment	xxx	$1,000
Expense Ratio	0.1654	.0305
Expenses	$165.40	$30.50
Expense Difference Resulting From Substitution of More Efficient Asset	xxx	($134.90)
Efficiency Percentage	xxx	(81.6%)

As Table 2 demonstrates, a shift in the design of the forward-looking network from less efficient copper feeder to more efficient fiber feeder produces an 81.6% reduction in operating expenses even before the lower investment costs of fiber are taken into account. Thus, the phenomenon of lower forward-looking expenses that prompted Verizon to create the FLC adjustment factor is nothing more than what should reasonably expected by a shift to a more modern, efficient forward-looking asset base.

Q. ARE THERE OTHER PROBLEMS WITH THE FLC?

A. Yes. Verizon suggests that the FLC is required because according to the Panel, "…it is unlikely that reflecting aggressive discounts in material prices of equipment will subsequently produce concomitant reductions of like

magnitude in the maintenance and administration of the equipment." Panel Testimony at 57, lines 13 – 16. However, Verizon has not provided any information that suggests that the discount assumptions underlying the forward-looking TELRIC costs are more aggressive than those Verizon has been able to achieve in building its embedded network. In fact, if the discounts implicit in the embedded network are steeper or more aggressive than Verizon's forward-looking discounts, an argument must be made for a reverse forward-looking-to-current ratio, producing lower forward-looking expenses. Without such information on the relative discount levels in the embedded and forward-looking investments, no FLC or reverse FLC can be meaningfully developed.

Q. BUT DIDN'T JUDGE LINSIDER RECOMMEND ADOPTION OF THE FLC IN NEW YORK?

A. Judge Linsider adopted a variation of the FLC proposed by Verizon in that proceeding. However, his analysis did not focus on those circumstances that would legitimately result in forward-looking expenses that are lower than embedded expenses – issues such as the relative mix of assets in the forward-looking environment vis-à-vis the embedded network and the discounts implicit in the embedded investment. For the reasons we have just discussed, Verizon's FLC factor is

not consistent with TELRIC and should not be allowed to stand.

Q. HAVE YOU MODIFIED VERIZON'S FLC IN YOUR RESTATEMENT?

A. Yes. I have eliminated Verizon's FLC in my restatement of Verizon's forward-looking costs, for the reasons that I just explained.

Asset Lives

Q. HAVE YOU MADE CHANGES TO THE ASSET LIVES AND NET SALVAGE VALUES USED BY VERIZON?

A. Yes, I adjusted the Verizon asset lives and net salvage values to those most recently prescribed for Verizon by the FCC as presented in the testimony of Mr. Lee.

Cost of Capital

Q. HAVE YOU MADE CHANGES TO THE COST OF CAPITAL AND CAPITAL STRUCTURE THAT VERIZON USES IN ITS STUDY?

A. Yes. Consistent with Mr. Hirshleifer's testimony, I adjusted the Verizon cost of debt, cost of equity and the capital structure to be used in developing VERIZON's forward-looking economic costs to provide UNEs.

Merger Savings

Q. DOES VERIZON INCLUDE AN ADJUSTMENT IN ORDER TO REFLECT THE ANTICIPATED FUTURE SAVINGS RESULTING FROM THE BA/NYNEX AND VERIZON/GTE MERGERS? ARE THESE SAVINGS PROPERLY INCLUDABLE IN TELRIC COSTS?

A. Verizon failed to include a specific adjustment to reflect the anticipated future savings associated with either the BA/NYNEX or Verizon/GTE mergers. The UNE operating expenses presented by Verizon are developed based on the ratio of 1999 operating expenses to 1999 investment.[23] To the extent that the 1999 operating expenses have not yet been purged of all embedded inefficiencies and Verizon has already quantified the level of merger savings, those merger savings should be reflected on a forward-looking basis. Indeed, the merger savings projected to result from the Bell Atlantic/NYNEX merger were not anticipated to be fully achieved until well after 1999.

Q. HOW SHOULD THE DEPARTMENT TREAT COST SAVINGS THAT WILL RESULT FROM THE RECENT MERGERS?

A. The development of UNE rates in this proceeding must consider the forward-looking cost savings anticipated from the efficiencies produced by the recent mergers. To reflect these anticipated savings, Verizon’s joint and

common cost factor should be reduced by the amount of the anticipated savings.

Q. HOW SHOULD THE LEVEL OF THOSE SAVINGS BE ESTIMATED?

A. In its recent filings in New York, Verizon incorporated the impact of anticipated merger savings by reducing the joint and common cost factor by a combined 2.5 percentage point (1.55% for the Bell Atlantic/NYNEX merger and 0.97% for the Verizon/GTE merger).[24] While there were inconsistencies in the way each of the percentages were calculated by Verizon that resulted in an understatement of the amount of the reduction, I believe a 2.5 percentage point reduction from Verizon's Massachusetts joint and common overhead cost percentage will produce a reasonable, albeit still quite conservative,[25] estimate of the amount of merger savings attributable to UNE's in Massachusetts.

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[23] See Verizon Cost Study Part G-2 Common Overhead.

[24] Verizon New York Filing Workpaper Part H, Section 3.11, Pages 5 and 5.1 of 5.

[25] Exhibit RAM-3, Section 5.5.2, to the Direct Testimony of AT&T witness Robert A. Mercer demonstrates that according to Verizon's own public statements about the beneficial effects of the merger, a merger savings of 3.57% is justified even though Verizon admitted to only a 2.5% effect in the current New York UNE cost proceeding.

Repair and Maintenance Expenses

Q. HAVE YOU REVIEWED VERIZON'S DEVELOPMENT OF ITS FORWARD-LOOKING CABLE REPAIR AND MAINTENANCE EXPENSES?

A. Yes. Verizon computes the maintenance and repair expense for metallic cable based on the embedded relationship of its current metallic cable repair and maintenance expenditures to its embedded cable investment.[26] Before computing the ratio, however, Verizon adjusts the actual repair expenses by reducing them by five percent for "Latest Design Standards." Verizon provides no explanation for this adjustment, which I believe falls short of the actual adjustment required to capture the maintenance and repair benefits of an all new metallic cable facility. When the new forward-looking plant specifically designed to serve current demand is installed, both repair expenditures associated with defective pairs and rearrangement expenses will decline from their historic levels. A more appropriate adjustment is a 30% reduction to both repair and maintenance expenses, which I have incorporated in my restatement. Indeed, a 30% reduction to both "R" and "M" dollars is consistent with Judge Linsider's recommendations in New York.

[26] See Verizon Cost Study Part G-5 – Network Factors.

Retail Avoided Costs

Q. HAVE YOU REVIEWED VERIZON'S DEVELOPMENT OF THE AMOUNT OF RETAIL AVOIDED COSTS TO BE REMOVED FROM THE TELRIC STUDY?

A. Yes. However I understand that the retail avoided cost study is not part of this proceeding. Hence, although I believe Verizon has significantly understated the level of retail avoided costs, I have not attempted to restate its study. I did, however, make one adjustment. I removed advertising expenses from Verizon's forward-looking cost study.

Q. PLEASE EXPLAIN WHAT AMOUNT OF VERIZON'S ADVERTISING EXPENSES SHOULD BE CONSIDERED RETAIL AVOIDED?

A. 100% of Verizon's advertising costs should be considered retail avoided. Verizon's proposal to include any advertising costs in the development of its claimed UNE costs is absurd and should be rejected outright. Effectively, Verizon would like its competitors to pay for its advertisements for a network that its competitors will not be able to lease through UNEs, and which may be more cost effective than the network construct used to set UNE rates. In short, Verizon's inclusion of advertising costs, which have historically been spent on advertising for retail services, for the development of its forward-looking economic costs to provide UNEs must be rejected.

Summary Of Loop Costs Restatement

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR RESTATEMENT OF VERIZON'S CLAIMED LOOP COSTS.

A. I have restated Verizon's loop cost study incorporating all of the modifications I discuss above. Table 3 summarizes my results by density zone and statewide for the two wire loop compared with Verizon's results.

Table 3
Summary of Restated Two Wire Loop Results

Density Zone	Verizon	Restated Verizon
Metro	$14.41	$5.33
Urban	$16.63	$6.79
Suburban	$20.15	$8.42
Rural	$28.20	$12.59
Statewide	$18.75	$7.76

The impact of each individual change is set forth in Exhibit 1 to my testimony. As I discussed previously, these loop results are very close to those produced by the HAI Model.

Details of my calculations are included as part of my electronic workpapers. Because these workpapers are restated versions of electronic models filed and deemed proprietary by Verizon, my electronic workpapers must also be treated as proprietary. My workpapers are being provided to the Department, Verizon, and other parties that have signed Verizon's protective agreement on a CD-ROM.

OTHER ISSUES:

OSS Onset Charges:

Q. HAVE YOU REVIEWED VERIZON'S CALCULATION OF FORWARD-LOOKING OSS ONSET CHARGES?

A. Yes. I have reviewed the testimony of Mr. Minion regarding Verizon's computation of OSS onset charges and have determined that those costs are overstated in at least two respects, resulting in costs that are more than twice properly developed TELRIC costs.

Q. WHAT PROBLEMS HAVE YOU IDENTIFED WITH VERIZON'S OSS ONSET CHARGE STUDY?

A. The first problem relates to the development of the forward-looking OSS computer hardware costs. Verizon develops these costs based not on the forward-looking costs of the necessary computer hardware equipment but rather based on outdated 1999 computer price levels. Based on the recent downward trend in computer hardware costs, use of 1999 as the base overstates investment.

Q. HOW SHOULD COMPUTER HARDWARE COSTS BE DEVELOPED?

A. Computer hardware costs should reflect the recent downward trend in computer hardware costs. Based on information provided by Verizon, computer hardware costs have declined 60 to 80 percent between 1996 and 1999. I have

conservatively estimated year 2002 computer investment costs at 50% of 1999 levels and have thus applied a 50% reduction to Verizon's OSS hardware costs in my restatement.

Q. WHAT OTHER PROBLEM DID YOU IDENTIFY WITH VERIZON'S OSS COSTS?

A. Verizon includes OSS maintenance costs as part of its OSS cost calculations. The Department previously determined that Verizon (Bell Atlantic) also benefits though improved operating efficiency from improvements to OSS and should thus itself bear a portion of the OSS maintenance costs. At page 54 of its Phase 4-L Order in the Consolidated Arbitrations docket, D.P.U./D.T.E. 96-73/74, 96-75, 96-80/81, 96-83, 96-94, issued October 14, 1999, the Department states:

> Putting aside one or two examples of a reduction in operating efficiency, it is clear that the kinds of improvements made to the OSS enhance both the ability of the CLECs to carry out their business and the ability of Bell Atlantic to remain competitive in a rapidly changing telecommunications environment.

Q. WHAT ADJUSTMENT DO YOU MAKE TO OSS MAINTENANCE COSTS IN YOUR RESTATEMENT?

A. Based on the Department's determination that because Verizon itself benefits competitively its OSS maintenance expenditures, I have reduced the amount of OSS maintenance

charges in Verizon's forward-looking study by 50 percent, reflecting a 50/50 split of these costs between Verizon and CLECs.

Q. WHAT IMPACT DO YOUR COMBINED CHANGES HAVE ON VERIZON'S OSS ONSET COSTS?

A. The two adjustments I make reduce Verizon's OSS Onset costs from $0.46 per line per month to $0.24. Details of my calculations are included in my electronic workpapers, filed and served in proprietary form on CD-ROM.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes it does.