Ex. ___(RC-SRT)

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

IN THE MATTER OF THE CONTINUED COSTING AND PRICING OF UNBUNDLED NETWORK ELEMENTS AND TRANSPORT AND TERMINATION	Docket No. UT-003013

SUPPLEMENTAL RESPONSE TESTIMONY OF

RICHARD CABE

ON BEHALF OF COVAD COMMUNICATIONS COMPANY

February 14, 2002

Introduction

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard Cabe and my business address is 221 I Street, Salida, Colorado.

Q. PLEASE BRIEFLY DESCRIBE YOUR PROFESSIONAL BACKGROUND.

A. I am an economist in private practice, specializing in economic analysis of regulatory matters in the telecommunications industry. I have presented testimony in matters concerning competition in the telecommunications industry to the public utility commissions of Alabama, Arizona, Colorado, Florida, Georgia, Iowa, Kentucky, Louisiana, Mississippi, Nevada, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, Texas, Utah and Washington, and to the Federal Communications Commission. Until May of 1999, I was employed as Associate Professor of Economics and International Business at New Mexico State University. In that position, I taught graduate and undergraduate economics courses and arranged the telecommunications curriculum for conferences sponsored by the Center for Public Utilities. Over my last several years at the university, I offered graduate courses in Industrial Organization, Microeconomic Theory, Antitrust and Monopoly Power, Game Theory, Public Utilities Regulation, and Managerial Economics for MBA students. My experience with telecommunications regulation began in January of 1985 when I was employed by this Commission. During my employment at the Washington Commission, I served as a staff member to the Federal - State Joint Board in CC Docket No. 86-

297. When I left the Commission staff to complete my doctoral degree, my title was Telecommunications Regulatory Flexibility Manager. My consulting clients since I left the Washington Commission have included aspiring new entrants into the local telecommunications market, state commissions, and consumer advocates. My resume is attached as Exhibit RC-1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. Covad asked me to evaluate Qwest's direct case on pricing of cooperative testing, unbundled packet switching, and, to the extent it was at issue in this proceeding, line sharing over fiber, and to provide recommendations to the Commission on those topics.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. Unfortunately, Qwest didn't provide adequate cost support for any of the price proposals I examined. With regard to cooperative testing, Qwest provides no cost support, but nevertheless argues that the same price should apply to cooperative testing and performance testing. Moreover, Qwest's proposed rates ignore the significant benefits to Qwest of undertaking cooperative testing with CLECs.

Regarding unbundled packet switching, Qwest provides documents it characterizes as a cost study, but the most fundamental component of a telecommunications cost study – the configuration of equipment that is being studied – is missing. From what one can tell from the information provided, the supposed cost study contains serious flaws. Most fundamentally, it is not based on lowest cost, forward-looking technology.

Regarding line sharing over fiber, it has only recently become clear that Qwest's proposed prices in this proceeding include what Qwest will eventually claim is line sharing over fiber. While Qwest's testimony doesn't mention line sharing over fiber, and Qwest refused to respond to a direct data request to identify rate elements necessary for line sharing over fiber, it has become clear from Qwest's recent position in another state that its "DA Hotel" and UPS proposals in this proceeding are precisely the products that Qwest will offer as line sharing over fiber.

My recommendation regarding cooperative testing on installation of loops follows, in part, from my conclusion that Qwest's installation costs will actually be lower when a CLEC incurs the expense of establishing its own testing capability and participates in cooperative testing of loops. I recommend that Qwest should be required to continue to provide cooperative testing at no additional charge for any CLEC willing to incur the internal costs of such testing. If Qwest's performance in delivering loops that satisfy all applicable technical specifications was to improve to the point that CLECs confidently could rely on Qwest's consistent ability to deliver good loops (in other words, that its installation process actually works), cooperative testing would not be necessary.

With regard to unbundled packet switching and line sharing over fiber (Qwest's DA Hotel proposal), I concur in the recommendation now before the Commission that there is a need to open a new docket to determine whether Qwest should be required to provide unbundled access to its packet switched

network,[1] and to address the nature of Qwest's obligation and pricing of unbundled network elements necessary for CLECs to provide advanced services in competition with Qwest's retail offerings.

Setting aside the clear need to examine the cost of service for unbundled network elements necessary for the provision of advanced services in the context of the terms and conditions under which they will be offered, there are additional deficiencies in what Qwest has presented thus far in connection with its UPS offering. More specifically, the so called UPS "cost study" (Cost Study # 5918) Qwest has presented in this docket is entirely inadequate. The documents Qwest refers to as a cost study for unbundled packet switching lack the most fundamental attribute of a telecommunications cost study. The cost study fails to describe the configuration of equipment used in the study. The point of a telecommunications cost study is to calculate the cost of owning and operating equipment necessary to provide some telecommunications service, wholesale or retail. Qwest has chosen to obscure, with the blanket of "vendor proprietary," a simple statement of what equipment Qwest is called upon to own and operate to provide the pertinent services.

[1] Before the Washington Utilities and Transportation Commission, Docket No. UT-003022 and Docket No. UT-003040, Twentieth Supplemental Order; Initial Order (Workshop Four): Checklist Item No. 4; Emerging Services, General Terms and Conditions, Public Interest, Track A, and Section 272 (Workshop Four Initial Order), at ¶ 250

Pricing Cooperative Testing

The Character of Cooperative Testing

Q. IS IT REASONABLE TO REGARD BASIC INSTALLATION WITH COOPERATIVE TESTING AS SOMETHING DIFFERENT THAN "ORDINARY" BASIC INSTALLATION?

A. No. Cooperative testing is a procedure intended to overcome Qwest's failure to adequately perform basic installations; if CLECs could be assured by some other means that Qwest's basic installations would be performed correctly, there would be no need for cooperative testing. This procedure is a cooperative effort that requires actions by both the CLEC and Qwest and which produces benefits for both Qwest and the CLEC. Cooperative testing establishes a collaborative process that provides CLEC testing of the loop if needed to augment Qwest testing capabilities. At the time of delivery the loop will be accepted if it meets Qwest's technical specifications, including data continuity from the end user to the central office demarcation point (typically, the ICDF), under the CLEC-performed testing; if it fails to satisfy technical requirements it is rejected. In any case, the outcome of a successful basic installation is the same with or without cooperative testing; the CLEC receives nothing from cooperative testing other than the assurance that the basic installation was successful. A basic installation must deliver for a CLEC's use a loop meeting appropriate technical specifications. The loop must be correctly connected to the CLEC's point of demarcation in a Qwest central office, and Qwest must provide accurate information that will allow the CLEC to identify the correct loop at the

customer's premises – "demarc" information. If Qwest were reliably performing these requirements of a basic installation CLECs would never choose to incur the cost of making employees and test facilities available, through cooperative testing, for Qwest and the CLEC to verify that installation has been successful.

Q. QWEST PROPOSES TO APPLY THE NONRECURRING CHARGES FOR BASIC INSTALLATION WITH PERFORMANCE TESTING TO INSTALLATIONS WITH COOPERATIVE TESTING. ARE COOPERATIVE TESTING AND PERFORMANCE TESTING SIMILAR ENHANCEMENTS TO THE BASIC INSTALLATION PROCESS?

A. No. As explained above, cooperative testing makes available the CLEC's testing facilities and personnel to verify the completeness and correctness of Qwest's installation effort. As discussed below, and in the testimony of John Donovan, Qwest avoids substantial costs by relying on these CLEC testing facilities and personnel, made available through the cooperative testing procedure, instead of relying on Qwest personnel and facilities to perform comparable tests. Performance testing, as an "enhancement" to the basic installation process, is nothing more than the delivery of the results of Qwest performance testing to the CLEC (this performance testing takes places with every basic installation); it involves no cooperative effort and makes no CLEC facilities or personnel available to Qwest during the installation process.

Q. QWEST'S DESCRIPTION OF BASIC INSTALLATION WITH COOPERATIVE TESTING (KENNEDY DIRECT, ERRATA PAGE 15) INDICATES THAT PERFORMANCE TEST RESULTS ARE PROVIDED

TO THE CLEC AS PART OF BASIC INSTALLATION WITH COOPERATIVE TESTING. IS THIS AN ESSENTIAL PART OF THE PROCESS?

A. No. This description of the process casts cooperative testing as something that occurs in addition to performance testing, and lends credibility to Qwest's proposal to impose the same charge for cooperative testing as for performance testing. Qwest's new rate proposal approximately *triples* the basic installation rate that Covad formerly paid for basic installation when the cooperative testing procedure was used at no additional charge. Covad does not want the results of Qwest's performance tests[2]. Covad would not incur the internal cost associated with cooperative testing if it could rely on Qwest's loop installations to meet required technical specifications. From Covad's point of view, cooperative testing is a necessary evil. In order to have confidence that a Qwest loop installation will work, Covad must bear the cost of standing ready to test each loop as it is delivered. The cost of Covad's loop testing activities is thus necessary for Covad's business, and also produces benefits for Qwest.

Q. WOULD PERFORMANCE TESTING SERVE AS A SUBSTITUTE FOR COOPERATIVE TESTING?

---

[2] Covad has never had an interest in the results of Qwest performance testing, except insofar as they arise in the cooperative testing effort to assist Qwest to deliver a loop that works to specifications. Because Covad has never had an interest in receiving the results of Qwest performance testing, and because Qwest initially participated in cooperative testing on basic installations with no additional charge, Covad did not examine Qwest's case in Part B to justify its proposal to triple the non-recurring charge for basic installation when performance test results are delivered by phone. Attached hereto as Exhibit RC-2 are Qwest responses to Covad Data Requests 2-21, 4-61.

A. Qwest states that it conducts performance testing on every loop installed, and the charge for performance testing is only imposed when the CLEC wants the results of Qwest's tests delivered by telephone. If Qwest actually conducted tests to verify that loops delivered to Covad satisfy Qwest's technical specifications, there would be no need for cooperative testing and, further, Covad would have no interest in receiving the results of Qwest's tests.

In response to Covad's first set of Data Requests (Data Request 5) Qwest stated that: "The purpose of cooperative testing is to see if the facility meets CLEC expectations, it does not identify "faults". The performance test that Qwest conducts on all such facilities prior to involving the CLEC is intended to identify "faults" or problems in the Qwest network. Any "faults" identified through performance testing are corrected prior to the cooperative testing."

This response suggests that CLECs seek cooperative testing in the hope of getting loops that exceed Qwest's technical specification for the type of loop ordered. This is certainly not the reason for Covad's request for cooperative testing, and indeed, if loops were thoroughly tested and faults corrected, Covad would not seek cooperative testing.

Qwest reiterated this position in response to Covad's second set of Data Requests (Data Request 18): "Qwest conducts performance tests when it installs every circuit. If during performance testing a fault is discovered, Qwest fixes the fault and makes sure the circuit meets the required specifications of the facility being ordered. Once the circuit meets required specifications Qwest will contact the CLEC for cooperative testing. The cooperative test made with the CLEC

ensures that the facility meets CLEC expectations and permits the CLEC the ability to either accept or deny the facility."

The nature of Qwest's testing is described with greater specificity in responses to Covad's third set of data requests. In response to data request 40 Qwest provides the SGAT description of performance testing, and confirms that "Qwest tests the circuit from the Network Interface (NI) at the customer premise to the Interconnect Distribution Frame (ICDF)."

If Qwest actually performed the tests described there would be no need for cooperative testing.

Finally, in response to Covad's fourth set of data requests, there is a hint that, actually, Qwest doesn't conduct performance testing on every circuit installed. In Qwest's response to Covad Data Request 61, we learn that: "Qwest conducts a level of performance testing prior to turning over a circuit to a CLEC. The level of testing varies between new circuits and re-used circuits. For new circuits, tests are conducted to ensure that the facility adheres to the technical specifications stated in Tech Pub 77384. For re-used circuits, Qwest completes abbreviated performance testing, primarily via ANI."

Since ANI is used with loops that terminate on a Qwest switch, and this doesn't apply to the loops ordered by Covad, it isn't clear what performance testing Qwest actually conducts. If Qwest could ensure, by whatever means, that its installations are performed correctly, Covad would not have any need for cooperative testing. Until Qwest accomplishes this quality control it will be necessary for Covad to stand ready to test every loop it orders from Qwest.

I note at this point that Covad requested that Qwest provide it with the performance and cooperative testing results for all loops ordered by Covad in the last 90 days. Although the parties ultimately reached an agreement whereby Qwest would provide that documentation for a more limited time period, Qwest provided the first installment of that documentation on Saturday, February 9, 2002; the remaining documentation, however, has not been provided as of the due date for my testimony. Accordingly, in light of Qwest's delay in providing this information, I will, of necessity, have to supplement my testimony.

CLEC testing produces benefits for the ILEC and costs for the CLEC

Q. IN WHAT WAY DOES COVAD'S LOOP TESTING ACTIVITY BENEFIT QWEST?

A. Qwest's costs related to installation of loops for Covad would be higher if Covad did not participate in cooperative testing. While Qwest could perform the same tests as those performed by Covad during cooperative testing, doing so would be costly to Qwest. As explained in the testimony of John Donovan, a loop to be delivered to Covad does not terminate on a Qwest switch; consequently, Qwest's Mechanized Loop Testing (MLT) facility is not available to facilitate repair or conditioning of the loop or to confirm the correctness of installation activities. When the loop does not terminate on a Qwest switch and thus isn't easily accessible from Qwest's MLT facility, the loop can be tested in a mechanized fashion from the Covad DSLAM on which the loop terminates, as soon as the central office portion of Qwest's installation effort is completed. Thus, so long as Covad participates in cooperative testing, when the central office portion of

Qwest's installation is completed Qwest can rely on Covad's mechanized testing capabilities.

Q. YOU STATED THAT QWEST'S INSTALLATION COSTS WOULD BE HIGHER IF COVAD DIDN'T PARTICIPATE IN COOPERATIVE TESTING. PLEASE EXPLAIN.

A. When Covad makes its testing facilities and personnel available by participating in cooperative testing, Qwest avoids certain costs associated with loop installations. If Covad did not participate in cooperative testing, Qwest would face two alternatives regarding the loop installations for which Qwest now receives the benefit of Covad testing. First, Qwest would have to undertake the central office dispatch activity described in Mr. Donovan's testimony. This activity would be necessary to replicate the mechanized testing currently provided by Covad through cooperative testing. With this central office dispatch, Qwest would test loops *before* delivery, just as Covad now does through cooperative testing, and Qwest could then deliver loops only after they have been confirmed to satisfy the relevant technical specifications. This would obviously entail increased costs for Qwest.

The second alternative would be for Qwest to perform the installation work and deliver loops as Qwest now does, but without cooperative testing, and without the effort necessary for Qwest to perform tests comparable to those that would take place during cooperative testing. Without cooperative testing (or comparable Qwest testing) some of the loops delivered would work to specification and some wouldn't, just as some are now accepted during

cooperative testing and some are rejected. The loops that failed to work to specification would lead to trouble tickets and Qwest would incur the expense of troubleshooting and repair[3], as well as the administrative cost of managing the trouble tickets. These obvious benefits of cooperative testing to Qwest apparently justified Qwest's initial participation in cooperative testing without any attempt to extract additional charges from participating CLECs, or at least from Covad.

Q. QWEST CLAIMS THAT IF THERE ARE PROBLEMS WITH A LOOP THE CLEC DOESN'T BECOME INVOLVED UNTIL ALL PROBLEMS HAVE BEEN RESOLVED. IS THIS CORRECT.

A. No. If Qwest reliably delivered working loops and accurate demarc information, CLECs would not choose to incur the costs of participating in cooperative testing. Despite Qwest's apparent claim to the contrary[4], Qwest regularly approaches Covad for testing of loops that are not ready for delivery. In this event, cooperative testing identifies a problem earlier than would otherwise be the case. Qwest regularly avails itself of Covad testing capabilities during the performance of installation work activities. Typically, when this occurs, a Qwest technician in the field engaged in installation activities[5] on a loop to be used by a Covad customer calls the Covad testing center to request a test on the loop being

---

[3] The cost of repair activities is not avoided when cooperative testing is available, but it is greatly diminished. Through cooperative testing, problems with a loop are identified when the Qwest technician is in the field, so the cost of additional dispatch that would be required to handle a trouble ticket in the absence of cooperative testing is avoided by using cooperative testing.

[4] Attached hereto as Exhibit RC-3 are Qwest responses to Covad Data Requests 1-5, 2-18

[5] If the loop is "new" rather than "reused," a serious question arises as to whether Qwest's activities are non-recurring costs associated with a single customer, or loop

installed, before the loop is due or offered for delivery. Although often called a pretest, if the pretest is successful, the Qwest technician calls it a cooperative test and requests that the Covad technician accept early delivery of that loop. Of course, if the loop fails the pretest, which it frequently appears to do from my time-constrained review of some of the documentation provided by Qwest regarding the testing of Covad's loops, then it is called a pretest and the Qwest technician calls Covad back after correcting the problem identified during the pretest to run the cooperative test. Furthermore, when troubles on a loop require the issuance of a trouble ticket, either after an unsuccessful installation attempt identified by cooperative testing or at any other time, Qwest benefits in exactly the same fashion from Covad testing capabilities. Qwest can use Covad testing as part of troubleshooting a faulty loop and also confirm resolution of the problem when the trouble ticket is closed out. As discussed above, and in the testimony of John Donovan, Covad provides Qwest with testing capabilities comparable to MLT on loops for which Qwest's MLT capabilities are not easily available.

Cooperative testing is justified by Qwest's present performance in delivering working loops

Q. YOU STATED ABOVE THAT COVAD WOULD NOT BOTHER WITH COOPERATIVE TESTING IF QWEST'S INSTALLATIONS WERE RELIABLE. PLEASE EXPLAIN.

A. As I explained, Covad's participation in cooperative testing is a costly activity. If it were not justified by some benefit Covad would certainly not continue. The

---

construction activities, properly capitalized as loop investment, and already accounted for and recovered through loop monthly recurring charges.

benefit to Covad of continuing cooperative testing is that cooperative testing allows Covad to avoid much greater costs imposed on Covad by unreliable Qwest loop installations. Whenever cooperative testing identifies a faulty loop offered for delivery Covad avoids the costly consequences of trying to deliver service to a Covad customer over a faulty Qwest loop. These consequences typically include the dispatch of a Covad technician, that technician's time spent troubleshooting the problem to isolate the fault to Qwest's loop, the administrative expense of opening a trouble ticket with Qwest, and perhaps most importantly, the cost to Covad's reputation of explaining the delay and inconvenience of an unsuccessful premises visit to a new customer. The only reason for Covad to continue with cooperative testing is to avoid these costs imposed on Covad by unreliable Qwest installations.[6] If Covad could rely on Qwest to deliver loops that work to specification with accurate demarc information, then there would be no need for Covad to participate in cooperative testing.

Qwest has offered no evidence that participating in cooperative testing is a cost rather than a cost saving to Qwest

Q. HAS QWEST INTRODUCED EVIDENCE REGARDING THE COST OF COOPERATIVE TESTING?

A. No. Qwest's case appears to be that, while performance testing and cooperative testing are different, "the time estimated to call the CLEC and provide

[6] Qwest's apparent position that it tests loop installations thoroughly (Qwest responses to Covad Data Requests 4-54, 4-56, 4-61 are attached as Exhibit RC-4) and fixes any problems identified in these tests (Qwest responses to Covad Data Requests 1-5, 2-18, Exhibit RC-3) strains credulity. While Covad doesn't maintain records that allow calculation of the percentage of loops offered for delivery that must be rejected at the

performance test results is about the same amount of time it takes to perform the cooperative test with the CLEC therefore, the pricing for both activities are the same." (Kennedy Errata, page 15A) This assertion is (1) no study of Qwest's narrowly defined costs of participating in cooperative testing, (2) doesn't even hint at the benefit that Qwest receives from access to CLEC testing facilities and personnel available through cooperative testing, which should properly be considered in cost estimation, and (3) does not address the cost imposed on CLECs by Qwest's failure to reliably perform installation activities. A careful and thorough study of all of these costs and cost savings might support the design of a scheme of cost-based charges between Qwest and CLECs participating in cooperative testing that would induce all parties to behave efficiently[7]. Conducting any such study would be a complex task, and Qwest has introduced no evidence that would be useful, or could be deemed a substitute, for such a study.

Allowing Qwest to impose a charge for cooperative testing establishes the wrong incentives

Q. YOU MENTIONED INCENTIVES FOR QWEST AND THE CLECS TO BEHAVE EFFICIENTLY. WHAT BEHAVIOR AND INCENTIVES ARE INVOLVED?

---

time of cooperative testing, and Qwest refused to timely provide such data, it is clear that a substantial number of problems are identified during cooperative testing.

[7] Developing such a scheme would be difficult, but plausible, in the absence of Qwest's incentive to harm competitors by imposing on them the costs of unreliable installations. Recognition of Qwest's incentive to make life difficult for competitors removes all hope of designing charges that would provide all parties with incentives for efficient behavior, and also points to the obvious policy prescription: Qwest must participate in cooperative

A. If it weren't for Qwest's incentive to harm competitors, it might be possible to devise incentive mechanisms that would lead Qwest to devote the optimal amount of resources to ensuring quality performance of installation activities, and lead CLECs to devote the optimal amount of resources to providing cooperative testing to support Qwest installation activities. Incentives would be established by instruments such as the price charged for successful installations, a penalty that might be charged for faulty installations, Qwest payments to CLECs whenever the CLEC is called on to use its testing capabilities in support of Qwest installation activities, and perhaps other types of charges. Establishing these charges in a cost-based way that would lead to efficiency would require a level of precision in estimating costs that, as a practical matter, is never available in real-world regulatory proceedings.[8] Adding the complication of Qwest's incentive to disadvantage competitors places this exercise in the design of optimal incentives squarely in the realm of the impossible.

Q. IS THERE A REASONABLE ALTERNATIVE APPROACH?

A. Yes. The straightforward approach is to recognize that the issue of cooperative testing is essentially a quality of service issue. The requirement to test every loop at the time of delivery is not an enhancement to the basic installation process, but a procedure that involves costs to both parties that will continue to be necessary unless Qwest devises other measures that ensure quality performance of

---

testing, without paying or imposing any additional charges, until installation performance has improved to the point that CLECs do not request cooperative testing.

[8] The cost estimates required for such an exercise would include Qwest's cost savings from repair activities avoided by the use of cooperative testing and the cost to CLECs,

installation activities. Qwest should be required to participate in cooperative testing with any requesting CLEC at no charge beyond Qwest's non-recurring charges for basic installation and the recurring charge for the loop. If Qwest takes other measures to ensure that its installations are reliable, CLECs will not request cooperative testing, preferring to avoid the cost of making their testing facilities and personnel available for cooperative testing. Of course, I have some concern that this will ever materialize. It is clear from Qwest's partial response to Covad's request for records regarding testing of loops during installation that, currently, whenever there appears to be a problem with a loop and the Qwest technician cannot marshal the resources to correct that problem in a timely fashion, the Qwest technician will contact the Section 271 lead for the State of Washington. I believe that the Commission should be seriously concerned about the prospect this suggests for Qwest's performance in loop installations when it doesn't have a Section 271 application before the Commission and there is no "271 lead" to expedite Qwest's efforts.

Q. IS IT REASONABLE TO ALLOW QWEST TO RECOVER A SIMPLE ESTIMATE OF ITS COST OF PARTICIPATING IN COOERATIVE TESTING WITHOUT CONSIDERING THE OTHER INFLUENCES YOU HAVE MENTIONED?

A. No. Qwest's proposal necessarily results in the Commission declining to concern itself with the quality of service Qwest provides in UNE loop installations, while simultaneously allowing Qwest to impose a charge on CLECs that choose to incur

---

including the cost of damaged reputation, that result from attempting to provide service

the expense of testing loops as Qwest offers them for delivery in order to ensure adequate quality of installation. This creates the wrong incentives for several reasons. First, the simple fact is that cooperative testing is a response to poor quality of Qwest installations. If Qwest only delivered loops that consistently and reliably worked to technical specifications, with accurate demarc information, neither Qwest nor CLECs would need to incur the costs of cooperative testing. The CLEC's internal cost of making available testing facilities and personnel for cooperative testing is a cost that Qwest imposes on CLECs – this would not be a cost of doing business if Qwest's installations were reliable. Qwest's incentive to impose costs on rivals is a well-understood economic phenomenon, and in this instance, it creates an incentive for Qwest to lower the quality of its installation activities in order to harm CLECs.[9] Qwest's ability to impose costs on rivals would be greatly enhanced by adopting Qwest's proposal to impose a charge on CLECs to cover Qwest's cost of participating in cooperative testing, without a reciprocal charge to cover the CLEC's costs and without a careful cost study that includes cost savings Qwest realizes through cooperative testing by avoiding trouble tickets and repair activities.

---

over incorrectly installed Qwest loops.

[9] See Stephen C. Salop, "Raising Rivals' Costs," *American Economic Review* 73, May 1983, pp 267-271

Pricing Unbundled Packet Switching

Qwest has not produced credible evidence of the cost of unbundled packet switching

Qwest's cost study for UPS is based on Remotely Located DSLAMs, which is not the Least Cost Forward-Looking Technology

Q. THE TESTIMONY OF JOHN DONOVAN EXPLAINS THAT THE LEAST-COST WAY OF PROVIDING THE FORM OF UNBUNDLED PACKET SWITCHING PROPOSED BY QWEST EMPLOYS NGDLC RATHER THAN REMOTELY LOCATED DSLAMS. PLEASE EXPLAIN THE IMPLICATION OF THIS CONCLUSION FOR QWEST'S COST STUDY.

A. "Cost," as the word is used in economics, always means lowest cost to accomplish whatever is under consideration. Qwest's definition of total direct costs, one component of Qwest's TELRIC calculation, provides that: "Total Direct Costs reflect the per-unit forward-looking cost associated with providing the entire network element *in the most efficient manner*, holding constant the production of all other network elements produced by the firm."[10]

If Qwest chooses, for reasons of its own, to provide a UNE in a way that is not the most efficient, lowest cost, way to provide the UNE, the additional cost is attributable to whatever reasons motivated Qwest to adopt the chosen approach rather than the least cost approach. Thus, the cost of providing UPS is the cost of providing UPS using the least cost technology. Here, Qwest bases its UPS costs and rates on a network architecture configured around remotely collocated

[10] Qwest Exhibit TKM-41, page 2, emphasis supplied

DSLAMs. As Mr. Donovan testifies, however, the least cost way to provide UPS is through NGDLC rather than remotely located stand-alone DSLAMs.

Q. DOES QWEST NOT HAVE AN INCENTIVE TO CHOOSE THE LEAST COST TECHNOLOGY IN A NEW INSTALLATION?

A. No. In general, Qwest has an incentive to choose the technology, or network architecture, that yields the highest profit. In certain idealized competitive conditions, choosing the technology that yields the highest profit comes to the same thing as choosing the least cost technology. In the present circumstances, Qwest has a very clear incentive to exclude or otherwise disadvantage potential competitors. Because access to unbundled network elements in Qwest's network is essential to competitors' operations, Qwest has an incentive to choose network architecture and technology that is least helpful to potential competitors. In choosing between two technologies with equal costs, Qwest has a clear incentive to choose the one that is least advantageous to competitors. Similarly, in choosing between a technology that would afford non-discriminatory access to competitors and a technology that would perform a function adequately for Qwest's retail purposes, but would offer access of little practical value to competitors, Qwest benefits from choosing the latter and has an incentive to tolerate a higher cost of operations in return for the benefit of excluding competition. It appears that Qwest's choice of remotely located stand-alone DSLAMs in preference to the more efficient alternative of NGDLC is a choice of this character.

Q. IN WHAT WAY IS ACCESS TO A NETWORK ARCHITECTURE BASED ON REMOTELY LOCATED STAND-ALONE DSLAMS DISADVANTAGEOUS TO QWEST'S COMPETITORS?

A. There are several disadvantages to the stand-alone, remotely located DSLAM architecture Qwest has chosen that make it particularly unlikely to afford useful access to Qwest's competitors. The most important of these is that Qwest's chosen technology requires a much larger "start-up" cost to entrants, a cost that is incurred with the first subscriber served rather than increasing gradually as more customers must be served. This amounts to increasing the cost that must be "sunk" to enter the market segment defined by the subscribers served through a particular Qwest remote terminal. The simple consequence of this manipulation of cost structures is to discourage entry.

Q. FOR THE COMMISSION'S PURPOSE IN THIS PROCEEDING, DOES IT MATTER HOW QWEST'S CHOSEN TECHNOLOGY DISADVANTAGES CLECS?

A. No. For the purposes of this proceeding, it suffices to note that Qwest's cost study is based on a technology that doesn't provide the UNE "in the most efficient manner." The character of the disadvantage to CLECs will be important for the Commission to consider in determining the nature of Qwest's unbundling obligation and prescribing terms and conditions under which Qwest must provide UNEs necessary for competitors to provide advanced services via either unbundled packet switching or through the requirement that Qwest provide as a single UNE unbundled access to line sharing over fiber, both of which appear to

be due for consideration in a separate proceeding, as recommended in the Initial Order on Workshop 4 Issues. In this proceeding it is important only to note that Qwest's profit incentives can lead it away from the choice of least cost technology, and, for whatever reason, Qwest has chosen to rely upon a technology in its cost studies which is not the least cost technology.

Qwest's "cost study" is a "black box" that cannot be examined

Q. ASIDE FROM THE ASSUMPTION OF TECHNOLOGY THAT IS NOT THE LEAST COST WAY TO PROVIDE UPS, HAVE YOU BEEN ABLE TO EVALUATE THE INPUTS AND ASSUMPTIONS THAT QWEST RELIED ON?

A. No. The version of the UPS recurring cost study that Qwest filed with its direct case in this proceeding lacked the most fundamental component of a telecommunications cost study; it contained no description of the configurations of equipment that would be used to provide the services under study. Before one can examine the structure and assumptions of a cost study it is necessary to form a clear understanding of the configuration of equipment being used. Review of the study then consists of verifying that the equipment specified is appropriate and the study correctly calculates the cost of owning and operating this equipment to provide a unit of the service under study. It also is common for telecommunications cost studies to provide diagrams showing the equipment used to provide the service under study and to describe the equipment in unambiguous terms, such as the manufacturer's part number.

The equipment configurations in the initial version of Qwest's UPS recurring cost study concealed all detail regarding equipment used under the headings: "Vendor 1 Configuration Equipment Investments Vendor Proprietary" and "Vendor 2 Configuration Equipment Investments Vendor Proprietary."[11] As originally filed, it was impossible to tell from the cost study what equipment was being specified. Qwest subsequently provided a copy of the cost study that identified vendors and provided Qwest's abbreviations of the investments in two different vendor configurations, but replaced all unit investment numbers with 1, so that "the cost results are meaningless after removing the vendor proprietary investment, but Covad is free to input the unit investments that they think to be appropriate to see the cost results." This "accommodation" was less than helpful, in part because Qwest's internal abbreviations for the equipment items and work activities that make up the investments are not industry standard abbreviations, and do not in fact convey a description of the equipment configuration on which the cost study is based. Further, guesses as to what some of the abbreviations stand for suggest that some items concealed under the heading "Vendor Proprietary" cannot be regarded as protected by a claim of vendor confidentiality.

In response to a Covad Motion to Compel, Qwest finally provided unit investment numbers, but they continued to be meaningless without translations of Qwest's internal abbreviations of the items that comprise the configuration of equipment. I'm informed by counsel that Qwest finally provided a list of definitions for the abbreviations it used, but since those were provided only one

[11] Qwest Exhibit TKM-41 Tab F, page 12

day before this testimony was due, there was absolutely no opportunity to actually review that information, undertake an evaluation as to the appropriateness of Qwest's assumed equipment configurations, and then incorporate a measured and complete response into my testimony.

Qwest's non-recurring charges for activities related to unbundled packet switching suffer from the same problem: without a clear description of the configuration of equipment involved and responses to a request for supporting information it is impossible to understand exactly what is included in the cost study. As with the description of vendor configurations, we only received a description of those activities the day before this testimony was due and thus Qwest's delay in providing this information prevented me from undertaking any kind of meaningful evaluation for inclusion in this testimony. I do not seek an opportunity to supplement my testimony in light of Qwest's late responses because it is clear that Qwest's underlying architecture (remotely located DSLAMs) is not the least cost forward-looking technology.

Qwest's cost study is simply wrong to include copper feeder facilities

Q. DOES QWEST'S COST STUDY FOR UNBUNDLED PACKET SWITCHING INCLUDE THE COST OF DIGITAL LOOP CARRIER (DLC) OVER COPPER CABLE?

A. Yes. It is clear from the description of investment for Unbundled Packet Switch Customer Channel shown in Qwest Exhibit TKM-41, Tab E that copper fed digital loop carrier equipment is included in the study.

Q. IS IT APPROPRIATE TO CALCULATE THE COST OF UNBUNDLED PACKET SWITCHING UNDER THE ASSUMPTION THAT SOME DLC WILL BE PROVIDED OVER COPPER FACILITIES?

A. No.

Q. PLEASE EXPLAIN.

A. The short explanation is that Digital Loop Carrier over copper is not a forward-looking technology; in a current installation, with modern technology available, it would not be economic to install copper cable for use with a digital loop carrier system. The testimony of John Donovan explains that fiber optic cable is the technology that replaced copper cable for digital loop carrier applications.

Qwest gives no explanation for its inclusion of this obsolete technology in a cost study that purports to estimate forward-looking costs. When pressed to give an explanation, I would expect Qwest to argue that it is economically efficient to install DLC on copper facilities when the copper is available and fiber would require a new installation. Qwest's Post-Hearing Brief in a recent case in Arizona argued that "the addition of RTs by definition is a change to the existing network and thus UPS to the RT should be based on the cost of adding to the network, not replacing the entire network."[12]

If we depart from the practice of estimating long run forward-looking costs and adopt Qwest's proposal of estimating the cost of an addition to the existing network, we encounter the problem of how to value sunk investment in the existing network, which embodies technology that would not be used in a

modern installation. If the Commission wanted to estimate the cost of owning and operating equipment to provide UPS, *as an addition to the existing network*, sunk investment in the existing network should be valued at the net salvage value of the asset. The opportunity cost[13] of leaving the asset in place is the price the asset would bring at salvage, less the cost of removal.

Not surprisingly, Qwest has not taken this approach. Qwest instead estimates the cost of purchasing, engineering, and installing new copper equipment that embodies obsolete technology. This can never be the correct approach. Fortunately, there is a simple resolution implied by Qwest's apparent claim that it is more economic to equip existing (sunk) investment in copper cable with a new DLC system than to build a new network with fiber optic cable. First, it would certainly *not* be most economic to use DLC over copper if new copper cable had to be purchased, engineered and installed, as it is in Qwest's cost study. If this were the case, copper cable would be the forward-looking technology and there would be no dispute. On the other hand, the correct (economic) way to make the decision whether to upgrade existing copper cable or to pull it out, sell it, and replace it with a fiber optic network, is to compare the cost of two alternatives.

The first alternative involves the cost of upgrading the existing copper network and operating it to provide service. Note that Qwest is not required to incur the cost of installing new copper; they would never do that because fiber is

---

[12] Before the Arizona Corporation Commission, Docket No. T-00000A-00-0194 Phase II-A, Qwest Corporation's Post-Hearing Brief, Dated December 19, 2001

the forward-looking technology. The second alternative involves the cost of building and operating a new fiber optic network. In this alternative the existing copper is available to remove and sell at salvage. The economic decision between the two alternatives depends on which has the lower cost, considering the net salvage value of the copper if it is removed.

This straightforward decision criterion shows two important points. First, it shows why sunk investments should be valued at net salvage value in calculating the cost of a network upgrade to old technology. Second, it shows that a correctly calculated forward-looking cost study is a conservative (high) estimate of the cost Qwest will actually incur.

Note that it will be economic to use the existing copper rather than build a new network if the following is true:

Cost of upgrading and operating existing copper network

Is less than

Cost of building and operating new fiber network + cost of removing copper – value of copper sold at salvage

By rearranging terms, this criterion is equivalent to:

Cost of upgrading and operating existing copper network + value of copper sold at salvage – cost of removing copper

Is less than

[13] Opportunity cost is the most fundamental concept of any economic approach to cost estimation. The opportunity cost of any asset is the value of the asset in its next best use.

Cost of building and operating
new fiber network

The cost of the existing copper cable appears in this decision criterion as it should, and follows the familiar rule of economic decisionmaking: sunk investments are always valued at net salvage value. Further, the decision rule in this form shows that a properly calculated forward-looking cost estimate, based on the cost of building a new fiber optic network, is a conservative (high) estimate of what Qwest will have to spend if Qwest finds it most economic to upgrade existing plant.

When Qwest argues that it is most economic to upgrade existing plant they argue that the cost of building and operating a new fiber network exceeds the cost of upgrading and operating existing plant. Qwest would have it both ways: Qwest denies the need to install new equipment, but would price wholesale services over the old equipment as if the old technology were being installed new today. The correct approach to estimating forward-looking cost is to estimate the cost of building new today and operating the new network using modern technology. There is never an occasion for estimating the cost of building new today a network based on outmoded technology. This is what Qwest has done by including the cost of DLC over copper in its UPS cost study.

Pricing UNEs needed for Advanced Services

Line Sharing Over Fiber

Q. PLEASE EXPLAIN QWEST'S INTRODUCTION OF RATES FOR LINE SHARING OVER FIBER IN THIS PROCEEDING.

A. In Data Request 22, Covad sought to understand Qwest's position as to the role any rate elements at issue in Part D of this proceeding might have in Qwest's offering of line sharing over fiber, even though Qwest's testimony did not address line sharing over fiber.[14] Qwest's refusal to respond to this data request in a substantive way lead Covad to believe that rates for line sharing over fiber were not at issue in this proceeding. Qwest's response to a similar data request in Minnesota, in tandem with the affidavit of one of Qwest's cost witnesses, Georganne Weidenbach[15] in that proceeding, however, made clear that the rates at issue in this proceeding do indeed comprise what Qwest will offer as line sharing over fiber. Qwest appears to maintain that its obligation to provide line sharing over fiber fed loops is satisfied by its remote collocation, or "DA Hotel" and UPS offerings.

Q. DID YOU EXAMINE QWEST'S COST STUDY FOR ITS DA HOTEL?

A. Not until it became clear that this would be Qwest's proposal for line sharing over fiber. In defining the scope of my assignment in this case, it appeared to Covad that the DA Hotel proposal involves an inefficient network architecture that is so costly that Covad would never use it, and hence had no interest in examining Qwest's proposal in detail. Once it became clear, through a discovery response in another proceeding, that Qwest's DA Hotel offering is its line sharing over fiber offering, I undertook a closer examination of the DA Hotel – or remote collocation – offering. What is clear is that the remote collocation cost study, insofar as it is intended to support a substitute for line sharing over fiber, is based

[14] Covad Data Request 22 and Qwest's response are attached as Exhibit RC-5

on the same erroneous choice of technology as the UPS study discussed above. Qwest has adopted a network architecture that doesn't embody the least cost forward-looking technology. As discussed in the testimony of John Donovan, Qwest has chosen a technology that doesn't accomplish its purpose "in the most efficient manner," but does put CLECs at a substantial disadvantage relative to Qwest's retail operations. It is interesting to note that certain assumptions related to remote collocation that appear in Qwest's cost study for UPS[16] are justified by reference to paragraph 34 of the FCC order on the SBC/Ameritech merger agreement. But paragraph 30 of that same order states: "The heart of SBC's original proposal is its Broadband Offering, which is a combination of network elements provided as a wholesale arrangement."[17] SBC's "Broadband Offering" is access to loops through NGDLC – which eliminates the need for CLECs to rely on something like Qwest's DA Hotel proposal and use the inferior technology of stand-alone remotely located DSLAMs to provide advanced services.

As I discussed in connection with Qwest's proposal for UPS, the nature of CLECs' disadvantage relative to Qwest's retail operations is a matter for concern when the Commission determines the extent of Qwest's obligations with respect to unbundling network elements related to advanced services, and the terms and conditions under which those UNEs will be provided. For the purpose of considering the cost support offered in this proceeding, it suffices to note that the least cost forward-looking technology for providing a combination of voice and

---

[15] Attached as Exhibit RC-6
[16] See Qwest response to Covad Data Request 06-071-b, attached as Exhibit RC-7.

packet switched data services in a DLC environment is through DSL capable NGDLC – not through Qwest's proposed remotely located stand-alone DSLAMs.

The Commission must revisit the question of pricing for unbundled packet switching

Q. SHOULD THE COMMISSION ADOPT PRICES FOR UPS IN THIS PROCEEDING?

A. No. Qwest's cost study for UPS is based on the wrong technology – one that is not the least cost forward-looking technology. Beyond this fundamental deficiency, it has proven impossible to date to review the study's details. It is clear, however, that the study must rely on assumptions that could change dramatically when the Commission takes up the task of considering the extent of Qwest's unbundling obligation. For example, Qwest notes that its obligation to provide UPS is limited to very unusual circumstances. This implies that Qwest must expect to provide very small volumes of UPS. If the Commission requires Qwest to provide UPS in a broader set of circumstances the appropriate volume assumption for studing the cost of UPS will be much larger. While Qwest only proposes to offer Unspecified Bit Rate service, a Commission determination that Qwest must offer other classes of service could substantially affect important assumptions in a cost study. I recommend that the Commission revisit this issue in conjunction with related questions that will arise in connection with the consideration of the nature and extent of Qwest's obligation to provide wholesale access to advanced services, including UPS, line sharing over fiber, and the role

[17] CC Docket No. 98-141 and ASD File No. 99-49 Second Memorandum Opinion and Order, released 8/8/2000, FCC 00-336

of Qwest's DA Hotel proposal. The Workshop Four Initial Order in the Commission's present SGAT proceeding acknowledged Qwest's obligation to allow line sharing over fiber fed loops and recognized the Commission's authority to "add items to the unbundled network elements list. "[18] Regarding the extent of Qwest's obligation to provide unbundled packet switching, the Workshop Four Initial Order stated that: "we believe this issue should be handled in a separate proceeding that specifically addresses network elements and the issues of "necessary" and "impair" as required by the Act and FCC Rules."[19] While Qwest has claimed that nothing in this proceeding is related to line sharing over fiber, it is clear from Qwest's arguments in Minnesota that the rate elements at issue in this proceeding encompass the UNEs that Qwest will offer in satisfaction of its obligation to provide line sharing over fiber.

Conclusion

Q. WHAT IS YOUR CONCLUSION AND RECOMMENDATION REGARDING COOPERATIVE TESTING?

A. Cooperative testing is not an enhancement to the installation process, but a collaborative procedure through which CLECs make testing facilities and personnel available to Qwest during installations. If Qwest's costs and benefits from this procedure were studied carefully, I believe it would become clear that cooperative testing is a net benefit to Qwest. CLECs incur their own internal costs to participate in cooperative testing, and do so only because they must in order to ensure that Qwest loop installations will work. I recommend that the

[18] Workshop Four Initial Order at ¶¶198, 249

Commission require Qwest to participate in cooperative testing without any charge to the CLEC beyond the non-recurring charge for basic installation.

Q. WHAT IS YOUR CONCLUSION AND RECOMMENDATION REGARDING UNBUNDLED PACKET SWITCHING AND THE REMOTE COLLOCATION ELEMENTS THAT APPEAR TO COMPRISE QWEST'S OFFERING OF LINE SHARING OVER FIBER?

A. It appears that, despite Qwest's response to Covad data request 22 in which Covad requested the identification of rate elements related to line sharing over fiber, Qwest's proposals on remote collocation and unbundled packet switching would establish prices for the set of UNEs Qwest will offer as line sharing over fiber. Qwest's cost support is based on a technological approach to the provision of voice and data in a digital loop carrier environment that is not the least cost forward-looking technology. The cost support offered is unacceptable for this reason alone. A variety of deficiencies in Qwest's filing and subsequent responses to data requests have prevented a more detailed examination of the cost support offered for unbundled packet switching. Furthermore, it is premature to estimate cost for UNEs necessary for the provision of advanced services before the Commission has determined the extent of Qwest's unbundling obligation and the terms and conditions under which these UNEs will be offered. I recommend that the Commission defer pricing of remote collocation and unbundled packet switching to a separate proceeding that addresses Qwest's unbundling obligation for UNEs related to advanced services.

---

[19] at ¶250

Q. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?

A. Yes, it does.

Richard Cabe, Ph.D.

President
Richard Cabe, Inc.
221 I St.
Salida, CO 81201

(719) 530-0278 (office)
(928) 447-6761 (fax)
Internet: Richard@SalidaMillwork.com

Education

Ph.D., Economics, University of Wyoming, 1988
Public regulation & Industrial organization
Natural resource & Environmental economics

M.A., Economics, Pennsylvania State University, 1980
Mathematical economics
History of economic thought

B.A., Mathematics, University of Maine at Presque Isle, 1978
Minor in Business Administration

AREAS OF INTEREST

Telecommunications industry
Microeconomics of technological change
Economics of Management

EXPERT TESTIMONY AND REPORTS:

Before the Federal Communications Commission, CC Docket No. 01-277: In the Matter of Application by BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance, Inc., for Provision of In-Region, InterLATA Services in Georgia and Louisiana; Declaration of Sherry Lichtenberg, Rene Desrosiers, Karen Kinard and Richard Cabe, on behalf of WorldCom, Inc.; Filed 22 October, 2001; Reply Declaration filed 13 November, 2001

Before the Public Utilities Commission of Nevada, Docket No. 00-7031: In re petition for review and approval of the draft application of SBC COMMUNICATIONS, INC., NEVADA BELL TELEPHONE COMPANY and WOUTHWESTERN BELL COMMUNICATIONS SERVICES, INC., d/b/a Nevada Bell Long Distance, for provision of in-region interLATA services in Nevada; Prepared Testimony of Richard Cabe, filed 6 August, 2001, on behalf of Commission Staff

Before the Mississippi Public Service Commission, Docket No. 2000-UA-999; Direct and Rebuttal Testimony filed April 16, 2001, on behalf of WorldCom, Inc.; hearing testimony 21 June, 2001

Before the Washington Utilities and Transportation Commission, Docket No. UT-003013 Part B: In the Matter of the Continued Costing and Pricing of Unbundled Elements, Transport and Termination and Resale; Response testimony filed 23 October, 2000, Supplemental Response testimony filed 20 December, 2000, on behalf of Rhythms Links Inc. and Covad Communications Company

Before the New Mexico Public Regulation Commission, Case No. 3317: In the Matter of the Investigation into the Rates and Charges of Institutional Operator Service Providers; Direct Testimony filed 21 August, 2000 on behalf of Gateway Technologies, Inc.; Rebuttal Testimony filed 31 October, 2000; Further Direct Testimony filed 10 August, 2001; Further Rebuttal Testimony filed 31 August, 2001; Supplemental Rebuttal Testimony filed 13 September, 2001; Hearing testimony 1 October, 2001

Before the Washington Utilities and Transportation Commission, Docket No. UT-003013 Part A: In the Matter of the Continued Costing and Pricing of Unbundled Elements, Transport and Termination and Resale; Direct testimony filed 19 May, 2000, Response testimony filed 21 July, 2000, Rebuttal testimony filed 4 August, 2000, on behalf of Rhythms Links Inc. and Covad Communications Company; hearing testimony 25 August, 2000

Before the Washington Utilities and Transportation Commission, Docket No. UT-960369: In the Matter of the Pricing Proceeding For Interconnection, Unbundled Elements, Transport and Termination and Resale; Direct testimony on behalf of MCI Worldcom filed 15 December, 1999; rebuttal testimony filed 7 February; hearing testimony 28 February, 2000

Before the New Mexico Public Regulatory Commission, Utility Case No. 3111, In the Matter of the Implementation of a State Universal Service Fund, Hearing testimony December 1, 1999 on behalf of MCI Worldcom

Before the Tennessee Regulatory Authority: "Public Policy considerations for Regulation of the InterLATA Telecommunications Market in Tennessee", Statement of Richard Cabe on behalf of MCI Worldcom in the Tennessee Regulatory Authority's consideration of amendments to the IXC Rule; filed September 14, 1999

Before the Iowa Utilities Board, Docket No. INU-99-3: In the Matter of Petition for Determination of Effective Competition, for Waiver of Accounting Plan Requirement and for Expedited Consideration; Direct Testimony filed September 10, 1999; Hearing testimony October 12, 1999

Before the Public Utilities Commission of the State of Colorado, Docket No. 99A-161T: In the Matter of the Application of U S West Communications, Inc. to Reduce Business Basic Exchange and Long Distance Revenues upon Receipt of the Colorado High Cost Support Mechanism in Accordance with Decision No. C99-222; Direct Testimony filed August 6, 1999

State of Florida Division of Administrative Hearings DOAH Case No. 98-2445RP: Telephonic Deposition of Dr. Richard Cabe in the matter of Florida Competitive Carriers Association, Inc.; Telecommunications Resellers Association, Inc.; AT&T Communications of the Southern States, Inc.; MCI Telecommunications Corporation; and Sprint Communications Company Limited Partnership, Petitioners, v. Florida Public Service Commission, Respondent. August 14, 1998 on behalf of Florida Competitive Carriers Association.

Before the Mississippi Public Service Commission, Docket No. 97-AD-544: Generic Proceeding to Establish Permanent Prices for BellSouth Interconnection and Unbundled Network Elements; Direct Testimony filed January 28, 1998; Rebuttal testimony filed March 13, 1998; Hearing testimony March 31, 1998; On behalf of AT&T Communications of the South Central States, Inc.

Before the North Carolina Utilities Commission, Docket No. P-100, Sub 133d: Review of Cost Studies, Methodologies, and Cost-Based Rates for Unbundled Network Elements; Direct testimony filed December 15, 1997; Rebuttal testimony filed March 9, 1998; Hearing testimony March 25, 1998; On behalf of AT&T Communications of the Southern States, Inc. and MCI Telecommunications Corporation

Before the South Carolina Public Service Commission, Docket No. 97-374-C: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost for Unbundled Network Elements and Interconnection Arrangements; Direct Filed November 17, 1997; Hearing Testimony December 16, 1997; On Behalf of AT&T Communications of the Southern States, Inc.

Before the Public Utilities Commission of the State of Colorado, Docket No. 97M-063T; On Behalf of AT&T Communications of the Mountain States, Inc. and MCI Telecommunications Corporations; In the Matter of the Administration of the Colorado High Cost Fund and the

Development of a Cost Model; Direct Testimony filed in the name of William Lehr; Hearing Testimony 1 December, 1997

Before the North Carolina Utilities Commission, Docket No. P-55, SUB 1022; Hearing Testimony September 30, 1997; In RE: Notification of Intention to File a Section 271 Petition for In-Region InterLATA Authority with the FCC Pursuant to the Telecommunications Act of 1996; Filed September 3, 1997; On Behalf of MCI Telecommunications Corporation and AT&T Communications of the Southern States

Before the Alabama Public Service Commission, Docket No. 26029, Review of Cost Studies; Filed August 29, 1997; Hearing Testimony September 24, 1997; On Behalf of MCI Telecommunications Corporation and AT&T Communications of the South Central States

Before the Georgia Public Service Commission, Docket No. 7061-U, Review of Cost Studies, Methodologies, and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services; Direct filed April 30, 1997; Rebuttal and Supplemental filed August 29, 1997; Surrebuttal filed September 8, 1997; Hearing Testimony September 18,1997; On Behalf of MCI Telecommunications Corporation and AT&T Communications of the South Central States

Before the Louisiana Public Service Commission, Docket No. 22022/22093; In RE: Review and Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies; Filed August 25, 1997; Hearing Testimony 12 September, 1997; On Behalf of MCI Telecommunications Corporation and AT&T Communications of the South Central States

Before the Public Service Commission, Commonwealth of Kentucky, In the Matter of: Inquiry into Universal Service and Funding Issues, Administrative Case No. 360, Filed July 11, 1997; Hearing Testimony August 6, 1997; on behalf of MCI Telecommunications Corporation

Before the Florida Public Service Commission, In The Matter of the Petition of MCI Telecommunications Corporation for Arbitration with United Telephone Company of Florida and Central Telephone Company of Florida concerning interconnection rates, terms and conditions pursuant to the Federal Telecommunications Act of 1996, Docket No. 961230-TP; Direct filed October 11, 1996; Rebuttal filed November 19, 1996; Hearing Testimony December 19, 1996; on behalf of MCI Telecommunications Corporation

Before the Arizona Corporation Commission, In The Matter of The Petition Of MCImetro Access Transmission Services, Inc. For Arbitration Of Interconnection Rates, Terms, And Conditions Pursuant to 47 U.S.C. § 252(b) Of The Telecommunications Act Of 1996, Docket No: U-3175-96-479; October 18, 1996; on behalf of MCImetro Access Transmission Services, Inc.

Before the Public Utility Commission of Texas, In The Matter of The Petition Of MCImetro Access Transmission Services, Inc. For Arbitration Of Interconnection Rates, Terms, And Conditions Pursuant to 47 U.S.C. § 252(b) Of The Telecommunications Act Of 1996, Docket Nos. 16300, 16355, October 14, 1996; on behalf of MCImetro Access Transmission Services, Inc.

Before the Public Utilities Commission of the State of Oregon, In The Matter of The Petition Of MCImetro Access Transmission Services, Inc. For Arbitration Of Interconnection Rates, Terms, And Conditions Pursuant to 47 U.S.C. § 252(b) Of The Telecommunications Act Of 1996, ARB 9, October 11, 1996; on behalf of MCImetro Access Transmission Services, Inc.

Before the Utah Public Service Commission, In the Matter of the Petition for Arbitration, Consolidation and Request for Agency Action of MCIMetro Access Transmission Services, Inc. Pursuant to 47 U.S.C. Section 252, Docket No. 96-095-01; Direct testimony filed 8 November 1996; Rebuttal testimony filed 22 November, 1996

Before the Iowa Utilities Board, In Re MCI Metro Access Transmission Services, Inc., Petitioning Party, and U S West Communications, Inc., Responding Party, Docket No. ARB-96-2, September 6, 1996; on behalf of MCImetro.

"Before the Public Utilities Commission of Oregon:UM 351, In the matter of the Investigation into the Cost of Providing Telecommun ications Services, Electric Lightwave, Inc.'s Response to Issues 1, 3, and 4, filed 30 August, 1993"

Before the Washington Utilities and Transportation Commission, In the Matter of the Complaint of GTE Northwest Incorporated against Pacific Northwest Bell Telephone Company with respect to Interexchange Traffic Utilizing Extended Area Service Facilities, Docket No. U-88-1719-F; on behalf of U.S. Metrolink Company; Cross Examination December 1989

"Affidavit of Richard Cabe", in Support of Motion of U.S. MetroLink Company for Suspension and Hearing in the matter of U. S. West Communications Tariff Filing 2056T before the Washington Utilities and Transportation Commission, September 1989

Implementation of the Colorado Telecommunications Act of 1987: An Evaluation", Report to the Colorado Public Utilities Commission, with Vinson Snowberger, June 30, 1988

Before the Energy and Utilities Committee of the Washington State House of Representatives, to present the Annual Report of the Utilities and Transportation Commission on the Status of the Washington Telecommunications Industry, February 1987

Before the Washington Utilities and Transportation Commission, In the Matter of Application of Pacific Northwest Bell for Banded Tariffs, Cause no. U-86-40; Cross Examination September 1986

Before the Washington Utilities and Transportation Commission, In the Matter of the Petition of AT&T of the Northwest for Classification as a Competitive Telecommunications Company, Cause no. U-86-113; Cross Examination April 1986

Cost of Service Information for Implementation of the Regulatory Flexibility Act, Report to the Washington Utilities and Transportation Commission, July 1985

"On Reducing Errors in Air Pollution Epidemiology," with S. Atkinson and T.D. Crocker, draft report, Institute for Policy Research, University of Wyoming to U.S. Environmental Protection Agency for Grant CR808893-01, April 1982.

PUBLICATIONS:

"Multimedia Economics" Instructional CD ROM included in 5 CD MBA Boxed Set, Pro One Software, Las Cruces, New Mexico, 1998

"Issues, Indicators, and Baselines: The Benefits and Hazards of Using a Natural Resource Accounting System in the RCA Analytical Process", with Jason Shogren and Stanley R. Johnson, in Evaluating Our Nation's Natural Resources, edited by T. Robertson, B. English, R. Alexander, and P. Rosenberry, University of Tennessee Agricultural Experiment Station, 1996

"CEEPES: An Evolving System for Agroenvironmental Policy", with Aziz Bouzaher, Stanley Johnson, Andrew Manale and Jason Shogren, p 67-89 in Integrating Economic and Ecological Indicators, edited by J. Walter Milon and Jason Shogren, Praeger, Westport CT, 1995

"Metamodels and Nonpoint Pollution Policy in Agriculture", with Aziz Bouzaher, Alicia Carriquiry, Phil Gassman, P. G. Lakshminarayan, and Jason Shogren, Water Resources Research 29, p. 1579-1587, June 1993

"The Effects of Environmental Policy on Tradeoffs in Weed Control Management", with Aziz Bouzaher, David Archer, Alicia Carriquiry and Jason Shogren, The Journal of Environmental Management, 36, #1, 69 - 80, Sept. 1992

"The Regulation of Non-Point Source Pollution Under Imperfect Information", with Joseph Herriges, The Journal of Environmental Economics and Management 22, 134-146, 1992

"Equilibrium Diffusion of Technological Change Through Multiple Processes", Technological Forecasting and Social Change 39, Number 3, May 1991

"Natural Resource Accounting Systems and Environmental Policy Modeling", with Stanley R. Johnson, The Journal of Soil and Water Conservation 45 # 5, p 533-9, September/October 1990

"Network Differentiation and the Prospects for Competition in Local Telecommunications", in Sixth Annual Current Issues Challenging the Regulatory Process, The Center for Public Utilities, New Mexico State University, 1990

"Prospects for Competition in the Local Exchange Telecommunications Industry", in Telecommunications Regulation in Washington State, Washington Utilities and Transportation Commission, January 29, 1989

"Rate of Return Regulation of Multiproduct Firms," Doctoral Dissertation, University of Wyoming, Department of Economics, 1988

Annual Report to the Legislature on the Status of the Washington Telecommunications Industry, principal author for the Washington Utilities and Transportation Commission, January, 1987

"Normative Economics and the Acid Rain Problem" with L.S. Eubanks, in T.D. Crocker, ed., Perspectives on the Economics of Acid Deposition, 1983, Ann Arbor Michigan: Ann Arbor Science Press.

"Intertemporal and Intergenerational Pareto Efficiency: An Extended Theorem," Journal of Environmental Economics & Management 9, p 355-360, December 1982.

"Investment Criteria for Projects with Intergenerational Effects," Masters Thesis, Pennsylvania State University, Department of Economics, 1982.

EMPLOYMENT

Teaching:
Associate professor, Department of Economics and International Business, New Mexico State University; 1994 - 1999, Tenure Granted 1995, Assistant professor 1990 to 1994: Antitrust Policy and Monopoly Power; Graduate Microeconomic Theory; Mathematical Economics; Industrial Organization; Seminar in Regulatory Economics; Economics of Risk, Uncertainty and Information; Game Theory; Advanced Seminar in Industrial Organization; Econometrics; Managerial Economics; Introduction to Economics; Microeconomic Principles

Assistant professor, Department of Economics, West Virginia University, 1983-1984: Graduate Environmental Economics; Principles of Economics.

Lecturer, Department of Economics, University of Wyoming, 1982–1983: Money & Banking; Intermediate Microeconomics.

Teaching assistant, Department of Economics, University of Wyoming; Fall, 1980.

Teaching assistant, Department of Economics and Department of Mathematics, Pennsylvania State University, five quarters in academic years 1978-1979 and 1979-1980.

Public Policy:
Economic Consultant, 1988. Performed economic analysis concerning regulation of the telecommunications industry under contract to the Colorado Public Utilities Commission and the Washington Utilities and Transportation Commission.

Associate, RCG/Hagler, Bailly, Inc. 1987-1988. Assignments included litigation support in Bell Operating Company requests for lessened regulation and a study of the effect on property values of proximity to a major defense facility containing hazardous waste sites.

Telecommunications Regulatory Flexibility Manager, Washington Utilities and Transportation Commission, 1985-1987. Duties included conduct of investigations and preparation of recommendations, primarily with regard to the telecommunications industry; preparing

evidence, assisting in cross examination and presenting expert testimony; and serving as a member of the Federal - State Joint Board Staff, FCC Docket 86-297, concerned with revising jurisdictional separations of telecommunications company costs and revenues.

Research:
Post-Doctoral Research Associate, Center for Agricultural and Rural Development, Department of Economics, Iowa State University, September 1988 to August 1990. Participate in policy-oriented economic research and serve as liason to the Economic Research Service, USDA.

Research Associate, Department of Economics, University of Wyoming, spring 1981 through summer 1982. Theoretical modelling, data construction, and analysis on health effects of air pollution and application of economic methods to ecosystem modelling. Under the direction of Thomas Crocker.

Research assistant, Department of Economics, University of Wyoming, summer 1980. Data construction and analysis on health effects of air pollution. Under the direction of Ralph d'Arge.

Research assistant, Department of Economics, Pennsylvania State University, summer and fall 1979. Theoretical and empirical work with Assymetric Quadratic Gorman Polar forms (flexible functional forms with explicit analytical solutions for the dual cost or expenditure function). Under the direction of Jonathon Dickinson.

Other Employment:
One year, Administrative Research Assistant, Aroostook County Action Program, Presque Isle, Maine.

Four years, U.S. Coast Guard, Electronics Technician.

AWARDS
Washington Utilities and Transportation Commission employee award for contributions to a positive work environment, Olympia, Washington, December 1986.

Award of merit, College of Commerce and Industry, University of Wyoming, 1981.

John S. Bugas fellow, University of Wyoming, academic year 1980-1981.

PERSONAL
Born July 16, 1950; Pulaski County, Arkansas
Married, one child
Second language: Spanish

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 02-021

REQUEST:

Does Qwest propose to offer cooperative testing in conjunction with basic installations without Qwest conducting performance testing?

RESPONSE:

Qwest objects to this data request as seeking information outside the scope of this proceeding, on issues that were specifically addressed in the SGAT proceeding, and that relate to the terms and conditions of the services, not the costs and prices. Without waiver of this objection, Qwest provides the following response.

Qwest performs Performance Tests on every installation option..

Respondent: Robert Kennedy
Cindy Buckmaster

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 04-061

REQUEST:

In response to Covad Data Requests 5, Qwest states that "[t]he performance test that Qwest conducts on all such facilities prior to involving the CLEC is to identify 'faults' or problems in the Qwest network." In response to DR 18, Qwest states that it "conducts performance tests when it installs every circuit." With respect to those portions of Qwest's responses, is Qwest affirmatively stating that it conducts performance tests on all loops ordered regardless of the installation option selected? In other words, does Qwest conduct performance testing on all loops ordered with just the basic installation option?

RESPONSE:

Yes. Qwest conducts a level of performance testing prior to turning over a circuit to a CLEC. The level of testing varies between new circuits and re-used circuits. For new circuits, tests are conducted to ensure that the facility adheres to the technical specifications stated in Tech Pub 77384. For re-used circuits, Qwest completes abbreviated performance testing, primarily via ANI.

Respondent: Kathy Salverda

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 01-005

REQUEST:

With regard to Mr. Kennedy's testimony at page 14, please provide any information available to Qwest regarding the nature of faults identified through cooperative testing procedures. In particular, if any pertinent information is available to Qwest, please indicate the frequency of faults caused by the ILEC and faults caused by CLECs identified through cooperative testing.

RESPONSE:

Qwest assumes that by "faults", Covad means facility problems. The purpose of the cooperative test is to see if the facility meets CLEC expectations, it does not identify "faults". The performance test that Qwest conducts on all such facilities prior to involving the CLEC is intended to identify "faults" or problems in the Qwest network. Any "faults" identified through performance testing are corrected prior to the cooperative testing.

Respondent: Robert Kennedy

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 02-018

REQUEST:

Please describe Qwest's present practice regarding repair of faults identified and leading to rejection during cooperative testing.

RESPONSE:

Qwest objects to this data request as seeking information outside the scope of this proceeding, on issues that were specifically addressed in the SGAT proceeding, and that relate to the terms and conditions of the services, not the costs and prices. Without waiver of this objection, Qwest provides the following response.

Each loop is ordered via a set of NC (Network Channel) and NCI (Network Channel Interface) Codes. These codes come with a set of technical specifications that are defined in the applicable technical publication. The CLEC should be able to determine if these technical specifications will meet their needs and allow the facility to work with their equipment and any additional facilities that the CLEC may add.

Qwest conducts performance tests when it installs every circuit. If during performance testing a fault is discovered, Qwest fixes the fault and makes sure the circuit meets the required specifications of the facility being ordered. Once the circuit meets required specifications Qwest will contact the CLEC for cooperative testing. The cooperative test made with the CLEC ensures that the facility meets CLEC expectations and permits the CLEC the ability to either accept or deny the facility.

If the facility does not meet the CLEC's needs at the time of cooperative testing, the CLEC has the option of canceling its order or reviewing the specifications of other loop types. If the CLEC chooses to proceed with another loop type, the LSR must be re-submitted to change the NC/NCI codes. At this point, and the order process and interval will start over.

Also please see the responses to Covad 01-005 and 01-016 for additional information.

Respondent: Robert Kennedy
Cindy Buckmaster
Legal

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 04-054

REQUEST:

In response to Covad Data Request 5, Qwest stated that "[t]he performance test that Qwest conducts on all such facilities prior to involving the CLEC is intended to identify "faults" or problems in the Qwest network." With respect to that portion of Qwest's response, please identify specifically whether circuit continuity testing is included in the performance testing and, if so, from what point to what point Qwest tests for circuit continuity

RESPONSE:

Qwest tests its portion of the facility from its demarcation point in the central office to its demarcation point at the customer end. Please see the response to Covad 04-061.

Respondent: Kathy Salverda

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 04-056

REQUEST:

In response to Covad Data Request 5, Qwest stated that "[t]he performance test that Qwest conducts on all such facilities prior to involving the CLEC is intended to identify 'faults' or problems in the Qwest network." With respect to that portion of Qwest's response, please state how Qwest defines the "Qwest network."

RESPONSE:

Qwest defines its network from its demarcation point in the central office to its demarcation point at the CLECs end user's location.

Respondent: Kathy Salverda

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 04-061

REQUEST:

In response to Covad Data Requests 5, Qwest states that "[t]he performance test that Qwest conducts on all such facilities prior to involving the CLEC is to identify 'faults' or problems in the Qwest network." In response to DR 18, Qwest states that it "conducts performance tests when it installs every circuit." With respect to those portions of Qwest's responses, is Qwest affirmatively stating that it conducts performance tests on all loops ordered regardless of the installation option selected? In other words, does Qwest conduct performance testing on all loops ordered with just the basic installation option?

RESPONSE:

Yes. Qwest conducts a level of performance testing prior to turning over a circuit to a CLEC. The level of testing varies between new circuits and re-used circuits. For new circuits, tests are conducted to ensure that the facility adheres to the technical specifications stated in Tech Pub 77384. For re-used circuits, Qwest completes abbreviated performance testing, primarily via ANI.

Respondent: Kathy Salverda

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 02-022

REQUEST:

At paragraph 98 of the Workshop 4 Initial Order in Docket UT-003022, the ALJ concluded "that the FCC intends for incumbent LECs to provide line sharing on fiber feeder subloops. We therefore reject Qwest's insistence that line sharing only be available on copper." Please identify all elements or services that Qwest believes would be necessary to implement this aspect of the Order. For each element or service that has been developed, please identify the rate and cite to the applicable SGAT provision(s). For any element or service that is pending in this Part D, please identify the element(s) or service(s) and the proposed rate(s) and cite to the applicable testimony(s) and cost study(s). Please produce all workpapers relating to such element or service.

RESPONSE:

Qwest objects to this data request as outside the scope of this proceeding. In the prehearing conference order (26th Supplemental Order) in this proceeding, the ALJ discussed Covad's proposal regarding submission of additional evidence on the issue of line sharing over digital loop carrier, and stated at paragraph 9, "Parties presented evidence regarding DSL linesharing over DLC in Part B. It would be burdensome for parties to prepare testimony on this issue prior to resolution of the Part B issues. Covad's request may ultimately be consistent with the Commission's decision in Part B, but until the Part B Order is entered Covad's request is premature."

The provisions of paragraph 9 limit the scope of what Qwest is required to address in this Part D. Covad did not object to those provisions within 10 days as required by the prehearing conference order, thus, they govern the current state of the proceedings. Additionally, no order has been entered in Part B as of this date, so Covad's request remains premature.

Respondent: Legal

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Gregory Scott	Chair
Edward A. Garvey	Commissioner
Marshall Johnson	Commissioner
LeRoy Koppendrayer	Commissioner
Phyllis Reha	Commissioner

In the Matter of the Commission's Review and Investigation of Qwest's Unbundled Network Element (UNE) Prices	PUC Docket No. P-421/CI-01-1375 OAH Docket No. 12-2500-14490-2

QWEST CORPORATION'S

AFFIDAVIT

OF

GEORGANNE WEIDENBACH

February 5, 2002

AFFIDAVIT OF GEORGANNE WEIDENBACH

1. My name is Georganne Weidenbach. I am employed by Qwest Communications International as a Director in the Technical Regulatory Group, Local Network Organization. From 1996 to 1998, I served as the Lead Project Manager for Collocation and Interconnection for U S WEST, Inc., before the merger of Qwest and U S WEST.

2. I have held numerous positions with Qwest and U S WEST, including planning strategist and contract negotiator, where I provided subject matter expertise for collocation, and other topics related to interconnection. I also managed the Design Services installation and repair dispatch center for the Local Network Organization. In addition to these positions, I have extensive Marketing, Public Policy and Engineering background, including the development of written methods and procedures for Design Services and Collocation applications.

3. I hold a Bachelor of Science degree in business from Regis University, at Denver.

4. I filed direct testimony before the state of Minnesota, PUC Docket No. P421/CI-01-1375, In the Matter of the Commission's Review and Investigation of Qwest's Unbundled Network Element (UNE) Prices on December 14, 2001.

5. I have reviewed Covad's brief and it appears that they seek to line share over loops that are comprised of fiber feeder facility ("F1") and copper

distribution facility ("F2"). For example, loops may be comprised of copper, fiber, or a mix of copper and fiber with digital loop carrier ("DLC") systems (i.e. copper or fiber fed DLCs). The key point missing in the Covad brief is the fact that line sharing (the DSLAM) must be placed on copper. The capability to take the data back to the central office is available to the CLECs in the form of unbundled network elements and services of the CLECs choosing. Qwest provides unbundled network elements ("UNEs") to assist CLECs in line sharing, in all of these scenarios.

A) **Line Sharing over all copper loops** – Line sharing is driven by the splitter functionality on a copper loop at the digital subscriber line access multiplexer ("DSLAM") location in the ILEC central office.

B) **Qwest's remote DSLAM deployment** – Qwest places its own DSLAMs at remote locations in a cabinet at a cross box on the copper loop. The cross box is located at the end of the feeder where the feeder and distribution of the loop are cross connected. CLECs have the capability to place their DSLAMs in the same cabinet as Qwest's DSLAM is placed. The fiber in a DLC architecture feeds the DLC RT. From that RT to the cross box, the media can be either fiber or copper. Qwest offers multiple options for CLECs to connect from the DSLAM location back to the central office.

C) **Line Sharing over fiber fed DLC** – Qwest facilitates line sharing for all CLECs on any type of loop by allowing a CLEC to place a DSLAM in remote

collocation at any premises in the outside plant and purchase unbundled subloop transport back to the central office.

D) **Unbundled packet switching ("UPS")** – Qwest remains ready to offer UPS between the customer and the CLEC collocation in the central office where all four FCC conditions have been satisfied, i.e. where Qwest has deployed packet switching and where there is no space for remote collocation, no subloop transport available or no copper alternative.

E) **Card at a time placement** – Card at a time placement is not viable due to the need to utilize not only a line card (the "card at a time") but also the functionality of a control card and a trunk card. There is no universal card to provide a combination of loop concentration and high speed access. Control cards are static and cannot be partitioned. There are no universally adopted standards that support interchangeable DSLAM components.

I will address each of the above issues in the following sections of this affidavit.

1) Line Sharing over an all copper loop – True "Line Sharing" takes place via a DSLAM located in the central office near a splitter over an all copper loop which does not exceed 18kf in length.

Under current design standards when the loop is longer than 18kf (and often when it is longer than 12,000 ft.) it is usually comprised of fiber feeder facilities (F1) and copper distribution facilities (F2). When this occurs, line sharing, or DSL, cannot take place from the central office, but instead

requires remote DSLAM placement, where the copper distribution portion of the loop can be accessed. This is known as remote DSLAM deployment and can be accomplished by CLECs via remote collocation in the outside plant, in Qwest's architecture this is facilitated via remote collocation at "DA hotels."

Line sharing provides the high frequency inherent in the copper facilities for delivering xDSL services. In order for a service provider to deliver DSL services to its end users, a DSLAM must be placed, either, at the central office or at a remote terminal ("RT") in the outside plant, and always next to the splitter. Remote deployment of the DSLAM requires access to a cross connection for the presentation of the loop to the splitter. In cases where the end user customer is served via DLC, in order to provide DSL services, the DSLAM must be located in an RT where access to the copper distribution facility is located.

2) Line Sharing on fiber fed DLCs -- For loops that are served over fiber fed DLC, Qwest provides CLECs access to products that facilitate DSLAM placement in remote terminals, thus line sharing. Qwest provides CLECs two options for remote collocation at "DA Hotels" where loops are fed via fiber fed DLCs:

- Joint planned DA Hotel placement provides CLECs with DA locations where Qwest is placing its own remote DSLAMs.

- Qwest has overbuilt the DA Hotels to accommodate CLEC collocations; CLECs will always have access to a minimum of 15% of the DA Hotel for collocation space. A CLEC may request collocation at any Qwest OSP premises, including the DA Hotel, using standard collocation intervals.

3) Qwest's remote DSLAM deployment – Qwest's remote DSLAM deployment provides DSL services to loops that are fed with DLC. Qwest does not utilize the DLC technology that COVAD describes in its brief. Instead, Qwest has chosen the DA Hotel architecture) to ensure the greatest Quality of Service (QoS) to its customers (i.e., it's closer to the customer). In fact, in locations where Qwest serves its customers on DLC, it excludes itself from providing DSL to that customer at the central office. So, it must deploy its DSLAMs remotely where DLC exists in the loop, just as a CLEC would do.

   In fact, Qwest provides CLECs the same opportunity to place their DSLAMs in Qwest's DA Hotels, that Qwest has engineered to ensure space is available. In addition, Qwest provides CLECs the opportunity to market and enter a geographic area with its DSL services through "joint planning" in substantially the same time and manner as Qwest.

4) Unbundled Packet Switching – Qwest offers its packet switching product in accordance with the rules set forth by the FCC.

   The FCC rules on Packet Switching requires the ILECs to provide Packet Switching only after four conditions are met. They include :

(i) The [ILEC] has deployed digital loop carrier systems, including but not limited to, integrated digital loop carrier or universal digital loop carrier systems; or has deployed any other system in which fiber optic facilities replace copper facilities in the distribution section (e.g., end office to remote terminal, pedestal or environmentally controlled vault);

(ii) There are no spare copper loops capable of supporting the xDSL services the requesting carrier seeks to offer;

(iii) The [ILEC] has not permitted a requesting carrier to deploy a Digital Subscriber Line Access Multiplexer in the remote terminal, pedestal or environmentally controlled vault or other interconnection point, nor has the requesting carrier obtained a virtual collocation arrangement at these subloop interconnection points as defined by paragraph (b) of this section; and

(iv) The [ILEC] has deployed packet switching capability for its own use.

5) Card at a time placement is not viable due to the need to utilize not only a line card (the card at a time) but also the functionality of a control card and a trunk card. There is not universal card to provide a combination of loop concentration and high speed access. Control cards are static and cannot be partitioned. This creates a lack of demarcation which drives a lack of testability at the DSLAM. Such a situation results in the compromising of network reliability; this occurs in performing trouble isolation. The card is

comprised of multiple end users and functionality; the card also provides the voice splitting and data frequency. The card is not capable of segregating trouble isolation and alarm monitoring. No mechanism exists today for partitioning of the network management system and therefore, bandwidth allocation. In addition, no mechanism exists today for defining responsibilities for maintenance and repair (Who owns what?). There are no universally adopted standards that support interchangeable DSLAM components. Additionally, "card at a time" collocation would not work unless Qwest also provided UPS to connect the card with the central office because the card cannot use a subloop transport channel back to the central office. Card at a time is often referred to as "plug and play," this is a CPE concept and is inappropriate in the context of shared network elements.

Covad claims that it cannot afford the expense of remotely collocating a DSLAM and thus Qwest should provide lower cost solutions such as UPS (even where the FCC required 4 conditions are not met). Covad does not specify any specific costs related to their claim of lack of affordability, but Qwest believes that its own costs of installing remote DSLAMs and collocation hotels are much higher than Covad's. Attachment A to my affidavit shows that Qwest estimates that it will cost approximately $90,000 per remote DSLAM; this includes construction of the collocation hotel. Thus Covad's expenses pale in comparison to Qwest's.

Georganne Weidenbach

SUBSCRIBED AND SWORN to before me on this ____ day of February, 2002.

(Print Name of Notary)

(Signature of Notary)
NOTARY PUBLIC, residing at

My appointment Expires:

QWEST CORPORATION
STATE: Washington
DOCKET NO: UT-003013 Part D
CASE DESCRIPTION: In the Matter of the Continued Costing and Pricing of Unbundled Network Elements and Transport and Termination
INTERVENOR: Covad Communications Company
REQUEST NO: COVAD 06-071

REQUEST:

Provide any basis that Qwest relied on, and describe any analysis conducted by Qwest or on Qwest's behalf, in the course of adopting the input values and assumptions contained in the Excel file provided in response to Covad Data Request 5-65 set forth below. In every case, please provide any studies or documentation reviewed as part of the analysis, and describe the information relied on from each such study or document.

a. Vendor 1 Dedicated Retail Equipment percentage

b. Vendor 1 Retail/Wholesale Shared Equipment percentage

c. Vendor 2 Dedicated Retail Equipment percentage

d. Vendor 2 Retail/Wholesale Shared Equipment percentage

e. Vendor 2 Telephony/Data shared equipment percentage

f. Vendor 1 Percentage of total deployment

g. Vendor 2 percentage of total deployment

h. Vendor 3 percentage of total deployment

i. Vendor 4 percentage of total deployment

j. Percentage test set investments associated with data service

k. Additional Maintenance costs from Vendor 1 (VP-Inputs Cell E246)

l. Total number of subscribers by year from 2001 to 2007

m. Total number of remote terminals by year from 2001 to 2007

n. Average number of DA's per central office assumption

o. Number of subscribers a DS1 will carry assumption

p. Equipment utilization assumption

q. Common Cabling Retail/Wholesale allocation assumptions:

q(1) Retail Dedicated Equipment percentage

q(2) Retail/Wholesale Shared Equipment percentage

r. Adjustment factor for Vendor 1 Card Material cost

RESPONSE:

a. Vendor 1 Dedicated Retail Equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Vendor 1 equipment dedicated to the UPS service (100%).

b. Vendor 1 Retail/Wholesale Shared Equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Vendor 1 equipment that is used by both the UPS service and the Remote Collocation service (85% relates to UPS usage of equipment). The percentage reflects the space criteria set by Qwest, modeled after the SBC/Ameritech merger Agreement (FCC 00-336, Paragraph 34).

c. Vendor 2 Dedicated Retail Equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Vendor 2 equipment dedicated to the UPS service (100%).

d. Vendor 2 Retail/Wholesale Shared Equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Vendor 2 equipment that is used by both the UPS service and the Remote Collocation service (75% relates to UPS usage of equipment). The percentage reflects the space criteria set by Qwest, modeled after the SBC/Ameritech merger Agreement (FCC 00-336, Paragraph 34). It also takes into account the Vendor Equipment, which would have 4 shelves available in the Remote Terminal. In this vendor's case the shelves cannot be shared and thus the smallest increment that could be reserved for the Remote Collocation service was 25%.

e. Vendor 2 Telephony/Data shared equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Vendor 2 equipment shared between Unbundled Packet Switching and Remote Collocation, then further shared by the telephony equipment present in the Remote Terminal (75% for UPS multiplied by 50% for Telephony/Data Sharing) (37.5%).

f. Vendor 1 Percentage of Total Deployment provided by Subject Matter Expert - Product Management (87.5%).

g. Vendor 2 Percentage of Total Deployment provided by Subject Matter Expert - Product Management (7.2%).

h. Vendor 3 Percentage of Total Deployment provided by Subject Matter Expert - Product Management (4.8%). The surrogate used for Vendor 3 was Vendor 1.

i. Vendor 4 Percentage of Total Deployment provided by Subject Matter Expert - Product Management (0.5%). The surrogate used for Vendor 4 was Vendor 1.

j. Percentage test set investments associated with data service provided by Subject Matter Expert - Product Management. Product Management stated that the test set would be used only for Unbundled Packet Switching (100%).

k. Additional maintenance costs from Vendor 1 provided by Subject Matter Expert - Network Engineer (VP-Inputs Cell B246).

l. Total Number of Subscriber by year from 2001 to 2007 provided by Subject Matter Expert - Product Management.

m. Total Number of remote terminals by year from 2001 to 2007 provided by Subject Matter Expert - Product Management.

n. Average Number of DA's per central office assumption provided by Subject Matter Expert - Product Management.

o. Number of subscribers a DS1 will carry assumption provided by Subject Matter Expert - Network Engineer.

p. Equipment Utilization assumption provided by Subject Matter Expert - Product Management.

q. Common Cabling Retail/Wholesale allocation assumptions - See below.

q(1). Retail Dedicated Equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Common Cabling dedicated to the Unbundled Packet Switching service (100%).

q(2). Retail/Wholesale Shared Equipment percentage provided by Subject Matter Expert - Network Engineer. Through discussions with SME, equipment was identified as being dedicated to the UPS service, or as something used by UPS and the Remote Collocation service, where a CLEC could purchase space in the Remote Terminal. This weighting is used for Common Cabling used by the Unbundled Packet Switching service and Remote Collocation Service and accounts for the space criteria as described in subsection (d) above (75% relates to UPS usage of equipment).

r. Adjustment factor for Vendor 1 card Material cost provided by Remote Collocation Analyst. This factor allows us to adjust the Vendor 1 Material Card Cost for a small portion of infrastructure related cost and as such are required by the Remote Collocation as well as Unbundled Packet Switching.

Respondent: Lisa Avery