BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF DETERMINING PRICES FOR UNBUNDLED NETWORK ELEMENTS (UNEs) IN QWEST CORPORATION'S STATEMENT OF GENERALLY AVAILABLE TERMS (SGAT)	)))))	DOCKET NO. TC01-098

REBUTTAL TESTIMONY OF

DICK BUCKLEY

FOR

QWEST CORPORATION

JULY 28, 2003

TESTIMONY OF DICK BUCKLEY
TABLE OF CONTENTS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Dick Buckley. I am employed by Qwest Corporation as a Director in Policy and Law. My primary responsibilities are in the area of local loop cost modeling and analysis. My business address is 1801 California St., Room 2040, Denver, Colorado.

Q. HAVE YOU FILED TESTIMONY PREVIOUSLY IN THIS DOCKET?

A. Yes. I filed direct testimony on October 15, 2002.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to reply to the direct testimony provided by Timothy Gates on behalf the Commission Staff. I will address Mr. Gates' generalizations about the Qwest LoopMod program and his advocacy for various loop inputs. I will focus on Mr. Gates' inputs for drop lengths, structure sharing, plant mix, and placement activity mix.

II. TIMOTHY GATES

A. STRUCTURE SHARING PERCENTAGES

Q. MR. GATES STATES THAT THE DEFAULT SHARING PERCENTAGES IN LOOPMOD RESULT IN AN ESTIMATE OF SAVINGS THAT IS TOO LOW. DO YOU AGREE?

A. No. Qwest's default values for structure sharing reflect the experience and data that have been gathered by Qwest concerning structure sharing opportunities in a TELRIC network rebuild. While Mr. Gates cites Minnesota city ordinances that he claims encourage sharing, he fails to say how successful those ordinances are. If a utility company has a job scheduled for a particular route and no other companies have a business interest in placing a facility in the same location, there will be no sharing, regardless of the ordinance.

That is exactly what Dakota Cable experienced when they rebuilt the Bismarck, North Dakota cable television network. In that situation, Dakota Cable placed 220 miles of buried facilities and only 5 miles were shared. That was because of the fortunate coincidence that at the same time Dakota Cable was placing those facilities the power company was engaging in some concurrent placement activity in the same location for 5 miles.

This is a far cry from Mr. Gates' assumption that, on average, every foot of Qwest's feeder trench will be shared with another utility. Mr. Gates advocates sharing inputs of 60% for Urban Buried and 40% for Rural Buried. A 20% factor means that 40 out of every 100 feet of trench will have two companies sharing the cost equally. If the model is run with a 50% sharing factor, the user is assuming that two companies will split the trench costs for every foot of cable placed. A 67% sharing factor means that three companies will occupy every foot of trench and split the costs equally. That is not Qwest's experience nor Dakota Cable's experience. There simply is no evidence that Qwest or any other company placing facilities could ever experience that level of structure sharing. That fact is confirmed by other examples. In a hearing on discovery before the Utah Commission on October 22, 2002, counsel for AT&T Broadband stated that in upgrade situations "AT&T Broadband . . . doesn't have an opportunity to share our facilities."[1] Thus, unless the plant placement activity is taking place in a new development, it is highly unlikely that there will be a significant amount of structure sharing. When a facility provider replaces or upgrades cabling, the most likely situation is that they will bear the full cost of the trenching work.

There is ample evidence that the sharing opportunities will be far less than those advocated by Mr. Gates. Qwest's joint trench data for South Dakota shows that 20% is optimistic. The Colorado Commission agreed with this position. The sharing percentages for buried placement shown on page 19 of Mr. Gates' testimony result in

[1] Transcript, Hearing on Motions, October 22, 2002 (Utah PSC Docket No. 01-049-85), at 23.

89% of the placing cost being assigned to the incumbent. Mr. Gates adjustments to LoopMod reduce that assigned amount to approximately 63%. These values are out of line with industry experience in the real world and should be rejected in this case.

Q. MR. GATES STATES THAT QWEST'S ACTUAL EXPERIENCE IS OF LITTLE VALUE AND THAT AN EFFICIENT FIRM WOULD EXPERIENCE GREATER AMOUNTS OF SHARING. DID HE PROVIDE SUPPORT FOR HIS CONTENTION?

A. No. Mr. Gates provided only his opinion about this hypothetical "efficient firm." He apparently feels that real world experiences are irrelevant and that cost analysis should ignore information that would assist in making good business decisions. Discovery from CLECs and data from major cable television network builds indicates that replacement networks contain far less than 20% sharing. Qwest's growth activities are exactly where the most opportunities for sharing will exist. The amount of sharing that has occurred in that environment is more than accounted for in the LoopMod inputs. None of the CLECs or cable television operators cited in my testimony have achieved the level of sharing used in LoopMod, much less the totally unsupported values advocated by Mr. Gates.

Q. IS MR. GATES' CONTENTION THAT FIVE PERCENT SHARING IN THE UNDERGROUND IS TOO LOW CORRECT?

A. No. In his rebuttal testimony, Qwest's network witness, Mr. Dennis Pappas provides information on his outside plant experience. There are a variety of factors such as timing

of construction activity, budgetary constraints, and actual customer demand that will affect the ability of Qwest to share its placement costs. To expect Qwest to delay construction until another provider is willing to share the costs to construct a conduit system is illogical. Likewise, other companies are unlikely to speed up their construction schedule to take advantage of a Qwest project. An AT&T spokesperson addressed this specific point in an article (attached as Exhibit RJB-1) on co-trenching when he stated that placing fiber in a city's designated area just in case you may need to be in that area in the future was "inefficient business."[2] Construction activity is driven by demand. This Commission would not look kindly on held orders piling up while Qwest waits on the possibility that another company may come forward to share in a project. Mr. Pappas explains further why sharing of conduit systems has not occurred in the past and is unlikely to occur in the future.

Q. MR. GATES STATES THAT THERE ARE REVENUE OPPORTUNITIES ASSOCIATED WITH SHARING AND THAT QWEST IGNORES THESE REVENUES IN ITS MODELING INPUTS. PLEASE COMMENT.

A. In my testimony, I state that pole structures are sometimes "shared" through the use of pole attachment fees. Not only did I mention that power companies pay Qwest for attaching their cables to Qwest owned poles, I also stated that the reverse was true. So Mr. Gates' claim that Qwest ignored these opportunities is simply untrue. Qwest sometimes pays power companies for the right to attach Qwest cable to power company

[2] Dave Johnson in Interactive Week, "Can You Dig It?", February 12, 2001.

owned poles. In fact, these reciprocal arrangements typically produce more expenses for Qwest than revenues, but, to be conservative, the model inputs assume that attachment fees net to zero. Mr. Gates is incorrect in assuming that Qwest ignored the impact of attachment fees because there is no net revenue gained.

Q. MR. GATES CLAIMS THAT LOOPMOD IS INCORRECT IN ASSUMING "AN ENVIRONMENT IN WHICH THE TELECOMMUNICATIONS NETWORK IS REBUILT WHILE EVERYTHING ELSE REMAINS IN PLACE WITH NO OPPORTUNITY TO SHARE COSTS WITH OTHER UTILITIES." (GATES DIRECT AT 16). IS MR. GATES CORRECT?

A. No. Mr. Gates makes two fundamental errors. First, he completely mischaracterizes Qwest's position on structure sharing. Second, his reliance on the FCC's *Inputs Order* is inconsistent with the FCC's own statements regarding the appropriate use of that order.

Q. PLEASE CLARIFY QWEST'S POSITION ON STRUCTURE SHARING.

A. Mr. Gates' statement might erroneously cause someone to believe that Qwest takes the position that in already built-up areas Qwest assumes it will bear 100 percent of the costs of all structure. That, of course, is not Qwest's position. As I pointed out in my direct testimony and as reflected in LoopMod, Qwest's inputs to LoopMod assume that Qwest would bear the following portions of the structure costs:

Percent Incurred

	By Qwest
Aerial	50%
Underground	95%
Buried Feeder-Urban	80%
Buried Feeder-Rural	80%
Buried DG1	80%
Buried DG2	80%
Buried DG3	80%
Buried DG4	80%
Buried DG5	80%

Thus, while Mr. Gates claims that Qwest says it will have "no opportunity to share costs with other utilities," his testimony is demonstrably wrong. In fact, Qwest assumes that other companies will bear 50 percent of the cost of aerial structure. Despite the fact that there is no evidence that there has ever been a meaningful opportunity to share underground structure (see the Direct Testimony of Mr. Dennis Pappas), Qwest nevertheless assumes the 5 percent of those costs will picked up by another company. Finally, despite the fact that far less than 20 percent of the cost associated with a replacement network would be incurred in new subdivisions, Qwest assumes that 20 percent of the structure costs of buried plant will be borne by other companies. Qwest's proposed structure sharing inputs are highly conservative when compared to the real world ability to engage in the sharing of structure. In each case, Qwest has assumed a

greater level of sharing than experience indicates could possibly occur under the real world conditions that would exist in building a replacement network.

Q. IS MR. GATES' USE OF THE FCC'S *INPUTS ORDER* CONSISTENT WITH THE MANNER IN WHICH THE FCC HAS CHARACTERIZED THAT ORDER?

A. No. Mr. Gates' interpretation of the *Inputs Order* is both curious and clearly wrong. He goes so far as to say that "the FCC has **required** telephone companies to assume they will bear the following percentages of supporting structure costs across various density zones . . . ." (Gates Direct at 20; emphasis added). He then recites the structure sharing percentages used by the FCC in its *Inputs Order* for universal service fund purposes. His conclusion that these numbers are mandated by the FCC is not only wrong, but the very order he relies on—the *Inputs Order*—categorically concludes that these inputs should not be used for UNE pricing purposes.

Any claim that the *Inputs Order* mandates a particular input in a TELRIC study should be viewed with a jaundiced eye. It is important to understand that the *Inputs Order* had nothing to do with the establishment of the either TELRIC principles or TELRIC inputs. The *Inputs Order*—issued in November 1999—has become the shorthand name for the Tenth Report and Order in FCC Docket Nos. 96-45 and 97-160.[3] The purpose of those consolidated dockets was to establish a cost study methodology for

[3] Tenth Report and Order, *In the Matter of Federal-State Joint Board on Universal Service and Forward-Looking Mechanism for High Cost Support for Non-Rural LECs,* CC Docket Nos. 96-46 and 97-160 (released November 2, 1999) ("*Inputs Order*").

determining the explicit support mechanisms for universal service funding and to determine the cost model that would be used to compare the service areas of the different LECs so that the FCC could determine which LECs in which states would receive support under the federal Universal Service Fund (USF).

For that purpose only, the *Inputs Order* established input values that were "nationwide, rather than company-specific."[4] The FCC noted such data was appropriate "[f]or purposes of determining federal universal service support amounts" and concluded that it "would be administratively unworkable to use company-specific values in the federal nationwide model."[5] Thus, unlike TELRIC, where a real effort is made to identify state-specific and company-specific costs, no such effort was made in the model approved in the *Inputs* Order—commonly known as the Synthesis Model ("SM"). SM was useful for its intended purpose, but the FCC was clear from the very beginning that it was not intended for setting UNE prices:

> For universal service purposes, we find that using nationwide averages is appropriate. The Commission has not considered what type of input values, company-specific or nationwide, nor what specific input values, would be appropriate for other purposes. **The federal cost model was developed for the purpose of determining federal universal service support, and it may not be appropriate to use nationwide values for other purposes, such as determining prices for unbundled network elements. We caution parties from making any claims in other proceedings based upon the input values we adopt in this order.**[6]

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[4] *Inputs Order* ¶ 30.

[5] *Id.* ¶ 31.

[6] *Id.* ¶ 32 (emphasis added).

Thus, the FCC clearly stated that the results of the *Inputs* Order should not be used by parties to make claims in other proceedings, like this one. Despite that, Mr. Gates argues that Qwest, by asserting structure sharing percentages that reflect the reality of building a replacement network, has somehow violated the *Inputs Order.*

Q. HAS THE FCC MADE OTHER LATER COMMENTS ON THE ADVISABILITY OF USING FINDING FROM THE *INPUTS ORDER* IN TELRIC PROCEEDINGS LIKE THIS ONE?

A. Yes. The FCC's original caution against using the nationwide input data from the *Inputs Order* for setting UNE prices was not a casual one. In its first Section 271 approval order (New York), the FCC repeated its caution about misusing the results of the *Inputs Order*: "We specifically cautioned parties from making any claims in any other proceedings based on the inputs adopted in the [*Inputs* Order]."[7] The FCC has repeated—and substantially strengthened—these warnings several times.

The FCC has consistently said that determinations in the *Inputs Order* should not be used in determining UNE rates. For example, in its order granting Section 271 approval to SBC for long distance in Kansas and Oklahoma, the FCC stated that the "USF cost model provides a reasonable basis for comparing cost differences between states," but that the USF cost model that was approved in the *Inputs Order* "**should not be relied**

[7] Memorandum Opinion and Order, *In the Matter of Application by Bell Atlantic New York To Provide In-Region, InterLATA Service in the State of New York,* CC Docket No. 99-295, FCC 99-404, ¶ 245 (rel. December 22, 1999).

upon to set rates for UNEs."[8] In the Vermont Section 271 order, the Vermont commission, in the cost model it used for UNE pricing, had set the fill rate for switches at 72 percent for IDLC lines and 81 percent for analog lines. AT&T complained to the FCC that the model adopted by the FCC in the *Inputs Order* uses a 94 percent fill factor, and that the resulting rates were therefore not compliant with TELRIC. The FCC rejected that argument: "This record is insufficient for us to determine whether AT&T is making a valid comparison between Verizon's Vermont fill factors and the Synthesis Model fill factors, **which we have indicated should not be used for setting rates."**[9] The FCC's warning recognizes that estimating the costs of exchange service for the purpose of allocating universal service subsidy funds—the function of the *Inputs Order*—is fundamentally different from determining the TELRIC of specifically defined UNEs. The *Inputs Order* was never intended to be used as Mr. Gates purports to use it.

Q. ON SEVERAL OCCASIONS, MR. GATES CHALLENGES THE IDEA THAT TELRIC ASSUMES THE BUILDING OF A REPLACEMENT NETWORK. DO YOU AGREE WITH HIM?

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[8] Memorandum Opinion and Order, *In the Matter of Joint Application by SBC Communications Inc., for Provision of In-Region, InterLATA Services in Kansas and Oklahoma*, CC Docket No. 00-217, FCC 01-29, ¶ 84 (rel. Jan. 22, 2001) (emphasis added).

[9] Memorandum Opinion and Order, *In the Matter of Application by Verizon New England Inc. for Authorization to Provide In-Region, InterLATA Services in Vermont*, CC Docket No. 02-7, FCC 02-118, ¶ 36 (rel. April 17, 2002) (emphasis added). Memorandum Opinion and Order, *In the Matter of Application by BellSouth Corporation for Provision of In-Region, InterLATA Services in Georgia and Louisiana*, CC Docket No. 02-35, FCC 02-1147, ¶ 82 (rel. May 15, 2002) ("We have . . . specifically cautioned parties from making any claims in other proceedings based on the input values adopted in the *Universal Service Tenth Report and Order.*")

A. Absolutely not. The concept of a replacement network is widely viewed as a central assumption of a TELRIC analysis-that is certainly the view of the FCC. Six months after the passage of the Federal Act, the FCC issued what has become commonly known as the "*First Report and Order,*"[10] in which the FCC provided a detailed definition of the TELRIC methodology. In the *First Report and Order,* the FCC clearly articulated the fact that a TELRIC network is a reconstructed or rebuilt network:

> We, therefore, conclude that the forward-looking pricing methodology for interconnection and unbundled network elements should be based on costs that assume that wire centers will be placed at the incumbent LEC's current wire center locations, but that the **reconstructed local network** will employ the most efficient technology for reasonably foreseeable capacity requirements.[11]

It is difficult to conceive of an interpretation of the phrase "reconstructed local network" that does not involve the building of a new network to meet the current level of demand—in other words, TELRIC clearly calls for the building of a hypothetical network to replace the one that currently exists. This conclusion is inescapable when one considers the language of the *First Report and Order* that describes TELRIC as a "benchmark of forward-looking cost and existing network design" that "most closely represents the incremental costs that incumbents **actually expect to incur** in making network elements available to new entrants."[12]

The FCC has subsequently made it clear that it views its rules as calling for the estimation of a "replacement" network. In its brief in the *Verizon v. FCC* cases, the United States Supreme

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[10] First Report and Order, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, 11 FCC Rcd 15499 (August 1996) ("First Report and Order").

[11] *Id.* ¶ 685 (emphasis added).

Court case that validated the TELRIC methodology, the FCC stated that "[t]he essential objective of any forward-looking methodology is to determine what it would cost, in today's market, to replace the functions of an asset that make it useful. That is the asset's 'forward-looking cost (also known as its 'replacement' or 'economic' cost) . . . ."[13] CLECs like AT&T, have agreed with that conclusion. In its comments in the Verizon Pennsylvania section 271 case, AT&T characterized the FCC's TELRIC rule as requiring "a 'replacement' cost approach."[14]

Yet, in the face of these authorities, Mr. Gates demands that the Commission adopt structure sharing inputs that ignore the experience an efficient provider would "actually incur" in building a TELRIC replacement network. The Commission should reject his unsupported arguments.

B. PLACEMENT PERCENTAGES

Q. MR. GATES CRITICIZES THE LOOPMOD DEFAULT PLACEMENT ACTIVITY PERCENTAGES DUE TO LACK OF SUPPORT. ARE HIS CONCERNS VALID?

A. No. Except for the examples provided by Qwest witnesses, no one has a database of placement activities that were used in a TELRIC rebuild of a network. Indeed, discovery of CLECs in other state dockets has indicated that Qwest placement inputs are

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[12] *Id.* (emphasis added).

[13] Brief of the FCC, *Verizon Communications v. FCC,* at 6-7.

[14] Comments of AT&T Corp. In Opposition to Verizon Pennsylvania's Section 271 Application for Pennsylvania, CC Docket No. 01-138 (July 11, 2001), at 21.

conservative. Consequently, modelers have to use the opinions of network experts. As support for the default placement activity costs in the CLEC sponsored HAI model, the HAI Inputs Portfolio states that "[c]osts for various excavation methods were estimated by a team of experienced outside plant experts."[15] There is no mention as to how the placing activity mix was established. Qwest, on the other hand, has the experience gained in rebuilding the distribution network in Omaha and the data gathered from an interview with a cable television company that was involved in a similar project. This information supports both the placing techniques and the amount of sharing used in LoopMod. Mr. Gates criticizes LoopMod for lacking "TELRIC compliant assumptions."[16] If, by this, he means he disagrees with the placement activity mix, that concern is independent of the model functionality. LoopMod and CLEC models both allow the user to vary the mix of placing activities. The fact is that Mr. Gates has provided no support for the mix of placement activities he advocates. The Qwest inputs are supported by the real world experiences of a variety of major rebuild projects.

Q. MR. GATES SUGGESTS USING DATA FROM ACTUAL QWEST CONSTRUCTION WORK ORDERS TO ESTIMATE THE PLACEMENT ACTIVITY MIX. WOULD THIS APPROACH PROVIDE DATA APPROPRIATE TO A TELRIC STUDY?

[15] HAI Model Release 5.2a Inputs Portfolio, May16, 2001, at 146

[16] Testimony of Timothy J. Gates, June 18, 2003, at 28.

A. No. There are several problems with his approach. First, as noted above, TELRIC models a replacement network--in other words, rebuilding the network over a short period of time to meet the total current demand. That assumption thus presumes that the vast majority of network will be built in already established business areas and well established residential neighborhoods. Thus, the placement activity mix will be dictated by the fact that the relatively easy and inexpensive placement activities in new developments will not be available. The real world network to serve residential customers is, however, placed incrementally and mostly in new neighborhoods. Mr. Gates' proposal, therefore, would show a far higher percentage of placement in new developments than the underlying replacement network assumption of TELRIC would render realistic.

Second, TELRIC is designed to develop cost information that will approximate a competitive marketplace and provide competitors an indication of whether it is more economical to purchase UNEs or build their own facilities. Based on Mr. Gates' modeling design, which assumes an ILEC's economies of scale and the latest technology, but then incongruously assumes the new technology was placed decades ago, no CLEC would ever build facilities. His inconsistent mix of assumptions guarantees that it would always be much cheaper to lease facilities from the ILEC, a situation that is inconsistent with TELRIC and one of the underlying purposes of the Act. In the *UNE Remand Order*, the FCC made it clear that one of the Act's fundamental goals is to "encourage rapid deployment of new telecommunications technology" and that "consumers benefit when

carriers invest in their own facilities because such carriers can exercise greater control over their networks, thereby promoting the availability of new products that differentiate their services in terms of price and quality."[17] By assuming away the real world challenges of building a replacement network, Mr. Gates' approach will assure that UNEs will be the economic choice for CLECs and will thus thwart and explicit goal of the Act The reality is that any competitor that wishes to build facilities will have to deal with streets and landscaping if they wish to serve the existing customer base. If CLECs are willing to serve a slow growing and geographically scattered customer base (i.e., only the areas that would be serviced by new construction that will occur in the near future), they can build plant using Mr. Gates' placement assumptions. But that approach will not allow the CLEC to provide service to the universe of customers (which is assumed in a TELRIC model), nor will it achieve the economies of scale associated with serving the total universe. Mr. Gates' assumption that today's technology with capacity to serve today's demand was placed at the same time as thirty-year-old buildings and homes were constructed is completely illogical. It fails to provide any economic information that would allow a CLEC to make build or lease decisions. It is designed simply to reduce UNE cost results.

C. PLANT MIX

[17] Third Report and Order and Fourth Notice of Proposed Rulemaking, *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996,* CC Docket No. 96-98, 15 FCC Rcd 3696 ¶ 110 (1999) (*"UNE Remand Order"*).

Q. DOES MR. GATES MODIFY THE QWEST DEFAULT INPUTS FOR AERIAL PLANT?

A. Yes. The default aerial input for LoopMod is 14 percent. This is based on the Qwest region-wide percentage of aerial plant. This percentage has been declining as newer areas opt for out of sight plant. Some municipalities have even ordered that existing aerial plant be moved to a buried environment. SD Example. It is simply fanciful to assume a rebuild of the network would result in more aerial plant than currently exists. South Dakota has around 4 percent aerial, far less aerial than the Qwest region-wide average. In spite of this, Mr. Gates is proposing increasing the LoopMod default inputs by 50%. This adjustment is totally out of line with the facts. The Qwest inputs are supportable and appropriate for TELRIC modeling.

D. FILL FACTORS

Q. MR. GATES CLAIMS THAT "IT COULD BE ARGUED THAT FILL FACTORS ARE THE MOST IMPORTANT COST STUDY IMPUTS." DO YOU AGREE?

A. No. There are several other inputs to the loop studies that typically have greater impact on the study results than fill factors. Fill factors, as used by most industry loop models, determine the sizing of the cabling and outside plant equipment, but do not have a major impact on costs.

Q. HAVE YOU CONDUCTED A SENSITIVITY ANALYSIS TO DETERMINE THE IMPACT OF THE CHANGES RECOMMENDED BY MR. GATES?

A. Yes. If LoopMod is run using the FCC distribution fill factors used in the *Inputs Order*,[18] the loop investment drops $28.61, a 2.25% change in the total. As this result shows, Mr. Gates' contention that fill factors are the most important input is incorrect.

Q. MR. GATES STATES IN HIS TESTIMONY THAT "PER ITS OWN DEVELOPER'S ADMISSION" LOOPMOD DOES NOT ACCURATELY SIZE CABLES OR DETERMINE INVESTMENT USING THE DISTRIBUTION FILL FACTORS OPTION. DO YOU AGREE WITH THIS STATEMENT?

A. No. Mr. Gates misstates my testimony. In my direct testimony, I stated that when outside plant engineers design distribution areas, they do so using a "pairs per site" approach. In other words, distribution cables should have sufficient capacity so that every time a home is passed a certain number of pairs can be assigned to that location. Qwest models costs for distribution plant using this same approach. A forward-looking model should use designs for the network that are representative of how the plant will actually be built. Those are the designs that I recommended in my testimony. I also stated in my testimony that the model does have the capability to adjust the distribution designs based on user-defined cable sizing or fill factors. As shown above, adjusting those factors in LoopMod

[18] Tenth Report and Order, *In the Matter of Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs,* CC Docket Nos. 96-45 and 97-160, FCC 99-304 (rel. Nov. 2, 1999) ("*Inputs Order*"). On several occasions, the FCC has cautioned that its universal service cost model should not be used to set rates for unbundled network elements ("UNEs"), and I am not advocating that the Commission

does not produce a dramatic change in loop investment because adding or deleting pairs and changing fills does not significantly change costs because placing one pair costs about the same as placing multiple pairs. My recommendation not to use the fill approach was not based on the model's accuracy. My recommendation was based on the fact that the fill-based approach to distribution cable sizing is an inappropriate way to model loop investments. It is not the way that efficient carriers build plant *today*, so it should not be the way that an analyst models the plant.

Q. DO YOU AGREE WITH MR. GATES' STATEMENT THAT 1.33 PAIRS PER SITE PROVIDES MORE THAN ENOUGH SPARE CAPACITY IN THE DISTRIBUTION PLANT?

A. No. As far back as 1982, the AT&T Outside Plant Engineering Handbook[19] recommended "At least two pairs must be provided for each of the ultimate number of living units anticipated...." The increased demand for teen lines, fax lines, and Internet access lines even suggests that two pairs would be insufficient today. Mr. Gates is correct that wireless telephony and DSL will sometimes be a direct substitute for additional lines at a particular location. The dilemma facing the engineer is that no one knows where those locations are. Consequently, when plant is designed for a distribution area, it is designed consistently at all locations. The demand for additional pairs is transient. In other words, the demand at particular locations will vary from year to year as the needs of

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calculate the loop rate based on the inputs to that model. My use of the fill rate from the *Inputs Order* is only for illustrative purposes.

the occupants change. A home with young children may only demand one or two lines. Several years later, that same location with teens may require two or three lines. If the family moves out, the new occupants may request only a single line. The engineer designs the plant to attempt to minimize the cost for rearrangements and reinforcements, while not providing an excessive amount of plant at the initial deployment. Mr. Gates' recommendations do not account for the rearrangement and reinforcement costs that Qwest will incur when a section of cable experiences higher than average additional line demand--there is no guarantee, as Mr. Gates assumes, that demand for additional lines will be evenly distributed throughout distribution areas. The fact that there are sufficient pairs, in total, to meet demand, will not solve the problem where a particular leg of cable has exceeded his average demand and available pairs. Mr. Gates is modeling a network that is inefficient and will ultimately be more costly than the "pairs per site" design.

Q. MR. GATES ALSO SUGGESTS THAT THE SIZING FACTOR FOR DIGITAL LOOP CARRIER REMOTE TERMINALS SHOULD BE SET AT 90%. DO YOU AGREE WITH THIS STATEMENT?

A. No. Mr. Gates states that because "it is so easy to augment these systems,"[20] ILECs usually engineer remote terminals for six months. He is incorrect. Six months is the minimum engineering forecast period for channel units. It is certainly not the forecast period for the remote terminals. The Qwest policy, which is based upon efficient

[19] Outside Plant Engineering Handbook, August, 1982, at 3-3

[20] Testimony of Timothy J. Gates, June 18, 2003, at 58

practices, is to forecast demand for up to five years when placing a remote terminal. It is not economical to add incremental terminals to a location as growth occurs. The Qwest sizing factors of 80% for the terminal and 90% for the channel units placed in the terminal reflect the real world rules that engineers operate under. Mr. Gates' terminal sizing factor of 90% is unrealistic and is simply an attempt to lower costs without regard for the additional costs an efficient carrier would incur when the terminal capacity is quickly exhausted.

E. DENSITY GROUP (DG) DISTRIBUTION DESIGNS

Q. MR. GATES CLAIMS THAT THE LOOPMOD DENSITY GROUPS HAVE LITTLE TO DO WITH QWEST'S ACTUAL NETWORK. IS THIS CLAIM TRUE?

A. No. The LoopMod Density Group distribution designs accurately reflect the differences in technologies and design guidelines that exist between the various types of distribution areas. Different equipment is used to serve apartment complexes than is used to serve single-family sub-divisions. Density Group 2 is the LoopMod distribution design for multi-tenant/multi-building developments and provides the model information necessary to develop the investments that are incurred in those types of areas. Simply modifying the lot frontage, as is done in HAI, fails to adequately address the design differences between single family and multi-tenant developments.

Q. IN MR. GATES' DISCUSSION OF THE LOOPMOD DENSITY GROUPS, HE CLAIMS THAT THERE IS NO SUPPORT FOR THE DENSITY GROUP DESIGNS. PLEASE COMMENT.

A. The LoopMod User Manual included with the Integrated Cost Model (ICM) provides descriptions of the Density Groups (DG), how distribution areas are mapped to the Density Groups, what level of cable sizing each is designed with, and how the cable lengths are adjusted in the lot-oriented designs to reflect the varying density characteristics of each individual Distribution Area (DA). In his testimony, Mr. Gates cites language from an earlier vintage of the model, so it is unclear whether he was referencing the correct documents. He also cites an order that was issued in Minnesota prior to the development of LoopMod. He states that little has changed since that order when, in fact, Qwest has recently updated the distribution designs. The plat maps that were provided to Mr. Gates were the basis for those updates. While it would be nice to be able to gather a statistically valid sampling of the actual distribution areas ("DAs") in the Qwest region, neither Qwest nor QSI has the resources to conduct such an analysis. Furthermore, it is questionable what, if any, increase in accuracy would be gained from this exercise. All TELRIC studies are based on "models," not on an accounting replication of the network. The LoopMod DG designs provide a starting point for distribution investment calculations. Where the actual DAs are likely to vary in cost due to differences in density within the DG category, LoopMod applies a multiplier to adjust the design to better represent the actual DA. In this way, LoopMod "models" the likely distribution investments that would be incurred in that DA in the TELRIC world.

Q. HOW DO YOU RESPOND TO MR. GATES' CONCERN THAT THE DENSITY GROUP DESIGNS FAIL TO REFLECT PROPER ECONOMIES?

A. Mr. Gates' concern with a 900-pair cable is unwarranted. The fact is that the designs do not place multiple cables. They utilize cables that are appropriate for the density group design and the amount of demand in that cable section. The guidelines for distribution areas state that they will be in the range of 200 to 400 homes. Even with a three pair per site design, a 900 pair is large enough to serve the demand in a typical DA. If a higher utilization were imposed on the design, a 900 pair cable would far exceed any cabling requirements. LoopMod reflects the economies of scale that Qwest achieves in its network. As was shown earlier, major adjustments to the cable sizing factors result in a 2% change in the loop investment, which is hardly an overstated investment as claimed by Mr. Gates.

F. DROP LENGTHS

Q. MR. GATES MODIFIES THE DROP LENGTH INPUTS FOR AERIAL AND BURIED DROPS. DO YOU SEE A PROBLEM WITH HIS ADJUSTMENTS?

A. Yes. For aerial drops, Mr. Gates reduced both the DG4 and DG5 distances to 100 feet. He did this based on his claim that "[m]any companies will extend the buried cable to

within about 100 feet of the living unit and then use an aerial drop."[21] Utility companies do not extend buried plant onto private property to reduce the drop length. Regardless of whether the drop is buried or aerial, the drop will extend from the location of the pedestal to the living unit. The distance is the same for either type of placement.

Q. IN HIS DISCUSSION OF DROP LENGTHS, MR. GATES CITES ORDERED DROP LENGTHS FROM SEVERAL STATES. DO YOU AGREE WITH HIS CONCLUSIONS?

A. No. Mr. Gates cites ordered drop lengths that range from 50 to 300 feet and result in average lengths around 90 feet. These orders are from three Qwest states with the highest densities. South Dakota has less than one fourth the density (lines per square mile) of these other states. Qwest has conducted drop length studies in eight of its states. The average drop length from those studies is approximately 143 feet. The LoopMod inputs for South Dakota result in an average length of 131 feet. Mr. Gates advocates reducing inputs that are already conservative.

Q. MR. GATES STATES THAT HE HAS A CONCERN WITH THE VARIANCE OF DROP LENGTHS BY DG. IS HIS CONCERN VALID?

A. No. Without providing any evidence to the contrary, Mr. Gates claims that the Qwest assumption that larger lots (lower density) will coincide with longer drop lengths is incorrect. At the same time, Mr. Gates notes that the Minnesota Commission's 1999

[21] Testimony of Timothy J. Gates, June 18, 2003, at 69.

Order recommended a range of drop lengths that varied by density. Common sense would lead one to the conclusion that average drop lengths will be longer as density decreases. Contrary to what Mr. Gates stated, pole placement does not provide incentive to minimize drop length. Distribution plant is engineered so that the drop terminals will serve the greatest number of homes possible. If a terminal is placed such that it serves three homes in a sub-division with one-quarter acre lots and also placed so that it serves three homes in a sub-division with five-acre lots, it is highly likely that the latter scenario will yield longer drops. Exhibit RJB-2 shows the results of drop length studies conducted in eight of the Qwest states. These results support the LoopMod assumption that drops become longer as density decreases and they show that the LoopMod inputs are conservative.

Q. MR. GATES DISCUSSES THE LOOPMOD COST FOR PLACEMENT OF AERIAL DROPS. ARE HIS CONCLUSIONS CORRECT?

A. No. He is correct that the input item for aerial drop placement is mislabeled as cost per foot. It is a cost per drop. I tried to recreate Mr. Gates' run by setting the $61.43 to $0.6143. LoopMod produced the result I would have expected. The average loop investment decreased by $5.33. The $61.43 is a contracted charge for placement of aerial drops. Mr. Gates states that the cost of poles is "evidently" included in the aerial drop placement amount. He did not provide any evidence to support that statement and his claim is incorrect. The drop placement costs do not include the costs for purchase or placement of poles or anchors. Mr. Gates' adjustment of the cost from $61.43 to $30 is

supported only by his statement that he has "seen other drop placement costs around $23."[22] The LoopMod input is from contracts with companies that operate in South Dakota and are actually performing drop placements. Mr. Gates fails to produce any documentation that would justify the use of a $23 (or even a $30) placement cost for aerial drops.

Q. MR. GATES STATES THAT THE MOBILIZATION CHARGE INCLUDED IN THE QWEST DROP CALCULATION RESULTS IN A DOUBLE RECOVERY. DO YOU AGREE?

A. No. Mr. Gates' provides no support for that claim. The mobilization charge is divided by 14 in the drop investment calculation (in the Drop tab of the LoopMod program). In essence, the mobilization charge only applies 7% of the time. Mr. Gates stated that mobilization charges should only apply on an exception basis. Qwest agrees and has applied them in that fashion. Completely eliminating the mobilization charge reduces the average loop cost by about $0.03. Mobilization is an appropriate, although minor, input in the calculation of drop costs.

G. DIGITAL LOOP CARRIER

[22] Testimony of Timothy J. Gates, June 18, 2003, at 71.

Q. MR. GATES PROVIDES AN EXPLANATION OF DIGITAL LOOP CARRIER (DLC) SYSTEMS AND THEN STATES THAT LOOPMOD USES COPPER FED DLC. IS THIS TRUE?

A. No. LoopMod uses three different DLC systems with five different remote terminal sizes. All of these remote terminals connect to the equipment in the central office via fiber optic cables. LoopMod has an option (which Mr. Gates discusses) that allows the user to state the results of a run on a fiber pair basis. This is used when the user wishes to develop the investment for a fiber facility that may be used by other models in conjunction with their unique electronics, the DS1 model for instance. When a user wishes to develop the investment for an unbundled loop, the correct selection for the option Mr. Gates discussed is DS0. That selection provides the investments from copper pairs or DLC equipment on a pair or derived channel level. That selection does not impact the configuration of the various DLC systems.

LoopMod uses integrated fiber-fed digital loop carrier systems. Mr. Gates' discussion of DLC contains numerous false statements about LoopMod. The unbundled loop investment developed by LoopMod is based on the use of Integrated Digital Loop Carrier (IDLC) systems. Exhibit RJB-3 shows that the components included for the central office end of the LoopMod DLC systems include only DS1 level channel units. They do not include DS0 level channel units. Mr. Gates claims that Qwest is modeling use of the universal interface in the DLC systems. If that were true, LoopMod would have to include DS0 channel units in the central office. It does not and Mr. Gates is wrong.

Qwest does develop a separate cost element for unbundled loop grooming outside of the cost development of the unbundled loop. Mr. Gates cites several vendor papers that discuss the unbundling of loops from IDLC systems. Each of those vendors is selling equipment to accomplish this task. That is exactly the type of equipment that is included in the Grooming cost element in the ICM output. Mr. Gates is free to adjust the grooming cost study to reflect the costs for the equipment discussed in his vendor sales brochures. But that does not affect the unbundled loop investments developed in LoopMod. LoopMod uses the IDLC systems that Mr. Gates says a forward-looking network should use. His claim that LoopMod does not use those systems is incorrect.

Q. IN HIS DISCUSSION OF IDLC, MR. GATES ADVOCATES THE USE OF 6 TO 1 CONCENTRATION ON THE GR-303 SYSTEMS RATHER THAN THE 4 TO 1 USED BY LOOPMOD. WHAT IS MEANT BY CONCENTRATION?

A. Concentration allows a DLC system to serve a group of end-users using fewer direct paths between the remote terminal and the switch. For instance, if a 672 line remote terminal is set up with a 1 to 1 ratio (no concentration), there would be 28 DS1s assigned to it (28 DS1s times 24 DS0s per DS1 = 672 DS0s). With a 4 to 1 ratio the same location would use 7 DS1s to serve the 672 DS0s. The concentration ratio in a DLC determines the number of DS1s used to support a remote terminal. The primary benefit for the loop associated with concentration is the reduction in the number of DS1 cards required on the central office end of the system. The remote terminal still requires four fiber strands connecting it to the central office. This will not change whether the remote is configured

at a 1 to1 ratio or a 6 to 1 ratio. Furthermore, changes in concentration do not affect the components required at the remote terminal location. The remote location will still require the same amount of power, the same cabinet, the same common equipment, and the same POTS channel units. The concentration simply allows for fewer DS1 cards in the central office and fewer DS1 connections to the switch.

Q. HAVE YOU QUANTIFIED THE IMPACT OF THIS CHANGE TO A 6 TO 1 CONCENTRATION?

A. Yes. Mr. Gates uses the following table to illustrate his projected impact of changing the concentration ratio.

Example

DLC Costs	Concentration Ratio	Number of End Users (DS0 Channels)	Cost per DS0
$1,000	1 to 1	1000	$ 1.00
$1,000	4 to 1	4000	$ 0.25
$1,000	6 to 1	6000	$ 0.17

His example fails to explain that the costs affected by the change in concentration are a tiny portion of the overall DLC costs. The reduction in the number of DS1 cards reduces the investment in the central office by about 10%. This equipment can support 5 remote terminals. The central office investment represents less than 10% of the total DLC system investment. Consequently, Mr. Gates' adjustment has about a 1% impact on the equipment portion of the DLC loops, which are about one third of the total loops in South Dakota. Mr. Gates' example is extremely misleading as to the importance of concentration. I reran LoopMod using the quantity of DS1 cards in the Central Office

Terminal (COT) that would yield a 6 to 1 concentration. The result was less than a $1 reduction in the average loop investment. Although it may be interesting to discuss the optimum level of concentration for IDLC systems, changes to that level will not materially impact the average loop investment.

Q. HAVE YOU ESTIMATED THE IMPACT OF RUNNING LOOPMOD WITH THE OTHER CHANGES MR. GATES ADVOCATES BUT COULD NOT MAKE?

A. Yes. Mr. Gates feels that DLC systems should be sized using a 90% sizing factor and that all DLC served loops should be on IDLC. I ran the feeder module in the LoopMod program with a 90% sizing factor and it reduced the investment of the average loop from $1,271.36 to $1,268.15 (a change of less than 3 tenths of a percent). I also adjusted the DLC remote selection process so that the small UDLC systems were replaced with the smallest IDLC system available in LoopMod. Moving from the low-density universal system to the larger, integrated system results in a less efficient network and a higher cost per working line for those locations. This change caused the average per loop investment to increase from $1,271.36 to $1,335.80. The model adjustments that Mr. Gates' was unable to incorporate in his study result in very minor changes to the overall loop investment.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

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Can You Dig It?
By Max Smetannikov

http://www.eweek.com/article/0,3658,s=722&a=6918.00.asp

The battle between cities tired of torn-up streets and optical fiber companies trying to meet the demand for fast Internet access is intensifying.

Cities from New Jersey to California are limiting when and where streets can be dug up. The new skirmishes will likely mean many businesses will have to wait longer and pay more for broadband access for their offices in major cities. Carriers have filed lawsuits over what they believe are exorbitant fees and unlawful restrictions on digging. City officials say citizens are tired of traffic jams, and taxpayers shouldn't have to subsidize network builders.

"It is a tough problem. Speed to market is a key for all of us, and these agencies are very aware of that, so to get your permits to go forth in a timely manner, you pretty much have to concede to anything they want." said Bob Boyeson, rights of way manager at Canadian fiber builder 360networks.

Co-trenching, also called co-digging or co-location, is a growing practice. City officials ask fiber-optic carriers looking to wire buildings in their municipalities to share a trench. Companies are invited to advertise their ditch-digging activities to competitors, so everybody can join in. Once a joint dig is finished, the street is repaved and closed to construction for up to five years.

Carriers said they have been asked to share trenches in Albany, N.Y.; Baltimore; Boston; Dearborn, Mich., Minneapolis; Salt Lake City; and White Plains, N.Y. Also considering the practice, carriers reported, are Washington, D.C.; the California cities of Berkeley, Oakland, Palo Alto, Santa Clara and Sunnyvale; and some Los Angeles suburbs.

The trend worries fiber-optic carriers. Because digging opportunities are generally advertised locally, as well as on the Internet, there is no guarantee that all carriers know about the deadlines. As a result, some may plan to enter a given city only to find that the designated time for digging has expired. Even if co-trenching information does get out, the odds that all interested carriers will agree on the exact location of a trench are slim, since most extend fiber when customers order it. To lay fiber in a city's designated area, just in case, is "inefficient business," said Dave Johnson, an AT&T spokesman.

But cities said they are just protecting their taxpayers.

"Should our taxpayers subsidize free or reduced cost of access to the right of way? We don't believe they should, and if the company wants to come in and use the public's property, they ought to be able to pay the public a fair market price for that use," said Bill Irving, associate city attorney of Dearborn. What Dearborn considers a "fair share" is based on a complicated formula, ranging from 30 cents to $1 per foot of fiber going into

the ground, or up to 4 percent of the revenue derived from that pipe. That's in addition to paying to have the street repaved.

Companies Pay to Play

Most companies doing business in Dearborn live with the deal. WorldCom, through affiliates, pays fees both per foot and based on revenue brought in by the fiber pipe. One company that challenged the setup as illegal — TCG, now owned by AT&T — ended up in court. While AT&T won the lawsuit, Dearborn plans an appeal.

Many more cities have instituted or are considering co-digging policies. Baltimore, for instance, just advertised for a 30,000-foot trench with room for up to 20 5-inch conduits, which translates into capacity that would start at around 4 petabits. The city advertised the dig, and already has three large unidentified carriers committed. Once the dig is completed, the street in question will remain paved for three years, said Cederic Crump, the city's director of operations. Future digs would have to go through a similar co-trenching procedure.

Carriers said they fear cities will require special payments from companies that miss digging windows. They are already being hit with special fees, they said.

"Some municipalities — and it is worrisome — are viewing our work as an opportunity to rebuild infrastructure we are not even affecting," complained Bill LaPerch, senior vice president of engineering and operations at Metromedia Fiber Network.

He said his company is laying a 10-foot extension of a fiber system into a building in a major city. Rather than being asked just to repave the part his company tears up for $35,000, he said, the unnamed city wants the company to repave the whole block at a cost of $750,000.

In Palo Alto and Albany, the municipalities decided to go into the fiber business themselves.

Albany officials asked 360networks to pay for six fiber conduits on top of the one the company has put in, said 360's Boyeson. "Most of these outfits agree not to resell it [fiber]. They use it for their own purposes. But often these cities are asking for so much capacity that they would be well beyond their realm of ever using themselves, so that makes you wonder," he said.

Palo Alto, which leases access to its fiber network to carriers, said the city-run backbone is very popular.

"We had about a 300 percent increase in customer requests from 1999 to 2000," said Leo Creger, Palo Alto's telecom manager.

Results of Drop Length Surveys

Average Lengths

	CO	MN	NE	NM	ND	WA	WY	Qwest
DG3	103	134	100	115	148	121	102	115
DG4	265	255	251	262	294	249	257	260
DG5	367	389	381	285	360	366	294	353
Average	**136**	**170**	**126**	**153**	**199**	**153**	**143**	**151**

Observations

CO	MN	NE	NM	ND	WA	WY	Qwest
1,313	658	1,035	610	571	1,227	439	5,853
186	108	77	123	52	156	94	796
85	67	69	74	151	116	49	611
1,584	**833**	**1,181**	**807**	**774**	**1,499**	**582**	**7,260**

Total

UT	Qwest + UT
103	143

UT	Qwest
1,476	8,736

GR-303 DLC Central Office Equipment List

Equipment list and quantities		Qty
1.	C.O. Terminal Equipment	
	a. COT Bay #1, Fiber fed, 7'	1
	b. COT Common Plugs	1
	c. COT Channel Bank Common PIE	3
	d. COT Dual Feeder Pkg.	1
	e. COT MCU card (for testing)	1
2.	C.O. Channel equipment	
	DS1 Cards-1 per 24 RT POTS cards	43 (4032 lines)
3.	C.O. Software	
	TR303 Software	1
	OMAPS Software	1
	Dual Feeder Software	1
	Multiple Remote SW per entire system (max=5RTs)	1
4.	Fiber Distribution Panels and Bay added to COT material:	
	a. Connector Mod, 72	8
	b. Bay number	1
	c. Bay endguard	2
	d. Bay Management Panels (2)	2
	Each system requires 4 connections:	
	/ Total 576 Connections	
	x 8 Required	
5.	DSX1 added to COT material:	
	a. DSX bay, (ten 84 port panels)	1
	Each DS1 card requires 1 connection:	
	/ Total 840 Connections	
	x 43 Required	