

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Review of:
Unbundled Loop and Switching Rates; the
Deaveraged Zone Rate Structure; and
Unbundled Network Elements, Transport, and
Termination

Docket No. UT – 023003

DIRECT TESTIMONY
OF
DENNIS PAPPAS
ON BEHALF OF
QWEST CORPORATION

JUNE 26, 2003

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I. IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, EMPLOYER AND BUSINESS ADDRESS.

A. My name is Dennis Pappas. I am employed by Qwest Corporation as a Director in the Technical-Regulatory Group of the Local Network Organization. My business address is 700 W. Mineral Avenue, Room MNH19.15, Littleton, Colorado 80120.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE, TECHNICAL TRAINING, AND PRESENT RESPONSIBILITIES.

A. I have worked in the telecommunications industry for twenty-four years. Between 1996 and 2001, I was directly associated with Interconnection and Wholesale Product Marketing. My first responsibilities in this area were as State Interconnection Manager for Colorado and Wyoming, a position that involved project management of all collocation activity. I later became a team leader for the Unbundled Loop and Collocation product teams. Subsequently, I became the Director of the Wholesale Product Marketing team and, during that time, led multiple groups in developing new products and processes for provisioning interconnection products and services for competitive local exchange carriers ("CLECs"). Subsequent to that assignment, I was the General Manager for Qwest Wholesale Emerging Diversified Markets and had responsibility for approximately 75 CLEC accounts. In late 2000, I left Qwest to accept a position as Vice President of Services at TESS Communications, which was a facilities-based CLEC in Colorado and Arizona that provided a suite of services, including telecommunications, data, long distance and CATV, to approximately 1,200

1 end users. In early 2001, I assumed the role of President of TESS with responsibility
2 for the day-to-day operations of the company. I left TESS in that same year and
3 returned to Qwest, where I again worked on the unbundled loop product team and
4 began participating as a witness in a number of section 271 workshops. In December
5 2001, I accepted my current position as Director in the Technical Regulatory Group,
6 Local Network Organization.

7 Prior to the years working in the area of interconnection, I held multiple titles and
8 positions requiring expertise in network operations, including, for example, Staff
9 Manager and Regional Service Manager in the Local Networks Organization. In the 14
10 years prior to those assignments, I worked in Network as an Installation and
11 Maintenance Technician (I&M Technician) and an Outside Plant Technician. As an
12 Outside Plant Technician, I was responsible for placing network facilities throughout
13 Northern Colorado utilizing all of the placement methods incorporated into Qwest's
14 unbundled loop cost model, LM3. I have placed both aerial and buried plant made up
15 of both fiber and copper-based facilities utilizing all placement methods – underground
16 placement, trenching, plowing, and aerial placement. I have extensive experience
17 placing facilities in new developments as well as replacing different parts of the
18 network on a rehab basis. I estimate that during my years as an I&M technician, I
19 installed approximately 12,000 service orders for end users and was dispatched on an
20 additional 8,000 repair reports. I have also repaired numerous damaged and cut cables
21 and have had extensive field experience involving cable maintenance. I performed

1 many of these tasks as recently as 1998. I have my Bachelor's degree in Business
2 Administration and a Masters in Telecommunications from the University of Denver.

3 **II. OVERVIEW OF TESTIMONY**

4 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE WASHINGTON**
5 **UTILITIES AND TRANSPORTATION COMMISSION?**

6 A. No I have not.

7 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

8 A. The purpose of my testimony is to support the Qwest network engineering assumptions
9 put forth in LoopMod3 ("LM3") including structure sharing, cable placement methods,
10 and an in-depth study of Qwest's drop lengths in Washington.

11 **Q. PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY**

12 A. My testimony focuses on a number of network-related issues, including the
13 assumptions relating to the engineering inputs made in the LM3 portion of Qwest's
14 Integrated Cost Model ("ICM"). That testimony demonstrates that the network-related
15 inputs in LM3 are reasonable and are based upon forward-looking engineering
16 practices. As I will discuss in the following testimony, it is important to recognize that
17 the LM3 engineering assumptions are interdependent. This means that if one
18 engineering assumption/input is modified, other related and/or dependent engineering
19 assumptions/input must be analyzed to determine if they too are affected by the
20 modification. This insures consistency in network design and architecture. LM3

1 permits this process of easily modifying inputs and assumptions to ensure consistency
2 in network principles and the design of a real-world network that uses efficient,
3 currently available technologies and engineering practices.

4 It is important to emphasize that these network and engineering assumptions are for
5 use in a TELRIC-based cost model. Thus, LM3 assumes construction of a new
6 replacement network, as opposed to a growth model. This replacement network
7 would be built in areas with existing structures – both above and below ground – in
8 place, and consideration must be given to how the presence of these structures affects
9 engineering assumptions and inputs.

10 Section III of my Direct Testimony addresses the engineering assumptions presented
11 in LM3 as they relate to structure sharing in both feeder and distribution plant. In
12 addition, my testimony deals with real experience, as an efficient carrier is able to
13 share the costs of placing cable structure with other utility companies. This is often
14 referred to as structure sharing.

15 Section IV contemplates the many different cable placement methods used to
16 construct a replacement network; specifically, underground, buried and aerial
17 placement methods.

18 Section V looks at fill factors or utilization levels that are assumed to exist in the
19 network not only today but in the future.

1 Section VI briefly describes the average drop distances produced by an expansive
2 drop survey conducted by Qwest in the state of Washington in 2001. This sampling
3 actually viewed 5,731 drop placement forms for the actual amount that a contractor
4 billed Qwest when the drop was originally placed. Qwest employees, acting as
5 contract inspectors, randomly inspect drop placement depth and length to ensure that
6 the contractor is meeting buried placement requirements and not over-billing at these
7 specific locations.

8 **III. STRUCTURE SHARING**

9 **Q. PLEASE DESCRIBE WHAT IS MEANT BY THE TERM "STRUCTURE**
10 **SHARING."**

11 A. Simply put, structure sharing is the placement or attachment of facilities by multiple
12 companies in the same trench or on the same terrestrial structure. Structure sharing is
13 the process of multiple utility companies constructing facilities at the same time, in
14 the same areas, utilizing the same trench or, in some instances, attaching to the same
15 poles. Structure sharing refers to the extent to which Qwest is able to: 1) share
16 physical structure with other utility companies; and 2) share portions of the costs of
17 placing its cable structures with other utility companies.

18 In the case of new developments, there are many phases that the project goes through.
19 One of the first, from an infrastructure standpoint, is placement of wet facilities (e.g.,
20 water and gas), which is then followed by the placement of curb and gutter and dry

1 utilities (e.g., electric, cable TV and telecommunications). For example, an electrical
2 utility may open a trench in a new development to place its facilities and offer other
3 utilities, such as cable television and telephone, the opportunity to use that same
4 trench to place their facilities.

5 As part of a structure sharing arrangement in these new developments, the utility
6 companies may be able to share a common trench and, in turn, the cost of digging
7 and back-filling the trench. However, it is only the cost of the trench that is shared.
8 Each utility is still fully responsible for the costs of the facilities it places in a shared
9 trench.

10 **Q. WHERE IS STRUCTURE SHARING LIKELY TO OCCUR?**

11 A. New developments present the greatest opportunities for structure sharing. In this
12 regard, however, it is important to emphasize again that as a TELRIC-based cost
13 model, LM3 assumes that a carrier is building an entire replacement network which
14 assumes that it will be placed in the world as it exists. As a result, the vast majority
15 of construction of this replacement network will occur in developed areas, not in new
16 developments. This fact distinguishes a TELRIC replacement model from a cost
17 model that develops costs only for new lines and growth. Accordingly, the
18 opportunities to share in building a replacement network are limited even if one were
19 to assume that other facilities were impacted by the same “scorched node” event.
20 The fact is that in both the feeder and distribution portion of the network, sharing
21 opportunities were limited when the plant was first placed and they will continue to

1 be limited as this new replacement network is built also. There are other practical
2 considerations that limit the ability to share, including, for example, the timing of
3 placing facilities. Utility companies often place their facilities at different times
4 based on different business needs and cannot afford to delay placing facilities until
5 other utilities are ready to do so. In addition, the networks of different utility
6 companies, particularly feeder networks, often follow different routes and have
7 different footprints, which significantly limit sharing possibilities until you are at the
8 front door of a given development. To further complicate the issue, other
9 telecommunications companies are reluctant to share network information with the
10 ILEC for fear of revealing confidential business plans. One must also consider
11 differing philosophies about placement within a specific development - some utilities
12 now insist on front lot placement, which may not conform to the manner in which
13 the telecommunications company plant has been designed.

14 **Q. WHEN STRUCTURE SHARING IS FEASIBLE, WHAT OTHER FACTORS**
15 **COULD AFFECT FACILITY PLACEMENT?**

16 A. The ability to structure share is dependent on several factors. Foremost on this list is
17 whether the facilities are feeder or distribution. Unfortunately, I am not aware of any
18 opportunities for Qwest to share the costs of placing underground cable (cable placed
19 underground enclosed within a conduit system) within the feeder portion of the
20 network. Opportunities also depend on whether the facilities being placed are aerial,
21 buried or underground plant, and the method being used to place the facilities (i.e., is

1 the cable being placed in a trench, is it being bored because of roads and other
2 obstacles, or does it need to be hand dug?). Finally, there is the significant question
3 whether the timing of the facilities placement allow for the coordination of the
4 placement to occur on a shared basis. In new developments, utility companies are
5 usually given an “open trench” date and often have a narrow window to order
6 materials, receive and place the facilities. If this window is missed, the utility
7 company then becomes responsible for opening a trench on its own and placing the
8 facilities.

9 Greater opportunities exist to share the costs of placing aerial facilities, as Qwest
10 often has joint use agreements with other utility companies relating to this type of
11 facility. LM3 properly reflects these different degrees of cost sharing opportunities
12 for the different types of plant placements.

13 The following sections go into more detail about the opportunities for structure
14 sharing in the buried, aerial and underground environments.

15 **Q. WHAT FACTORS DETERMINE THE VIABILITY OF STRUCTURE**
16 **SHARING FOR BURIED FACILITIES?**

17 A. The ability to structure share with buried facilities is dependent on the area in which
18 the plant is being placed, the method of placement being used, and the timing of the
19 placements. In addition, the ability to coordinate with other companies is critical.

1 **Q. YOU HAVE REFERENCED THE TERM “REPLACEMENT NETWORK”**
2 **SEVERAL TIMES IN YOUR TESTIMONY. WHY IS THE ISSUE SO**
3 **IMPORTANT?**

4 A. As stated earlier, the assumptions contained in LM3 are based on a replacement
5 network. As such, the assumption is that a majority of placements will occur in
6 established, fully developed areas, not in new developments. During the construction
7 of this replacement network, structure sharing will be limited, as noted above. In
8 addition, because of differing timelines, fiscal constraints, and consumer
9 requirements, utility companies usually have different construction schedules that
10 significantly limit sharing opportunities. In an area that is already developed, a
11 carrier usually does not have the luxury of waiting for an open trench or for someone
12 else to help bear a portion of the cost. Waiting can lead to held orders, which any
13 telephone company must strive to avoid.

14 **Q. HAVE YOU PERSONALLY EXPERIENCED OR SEEN THIS TYPE OF**
15 **REPLACEMENT NETWORK ACTIVITY BEING CONDUCTED?**

16 A. Yes, I have. While working at TESS Communications, I had the opportunity to
17 observe an overbuild of TESS’s network by Qwest in two developments, Rancho El
18 Mirage and Desert Sunset, in the Phoenix market. These overbuilds were prompted
19 by requests from a developer and from end users that insisted upon Qwest providing
20 them service. An overbuild presents the same types of obstacles that would occur in
21 a replacement network – the company placing the overbuild facilities must conduct

1 the build in a manner that is not typical in a green field build out. In this example,
2 existing facilities resided in the easement at the front of the lots and included
3 telecommunications, cable television and electric. Qwest had to place its cable,
4 pedestals and buried service wires within the same easement. In observing the work,
5 it did not appear that another utility was going into the open trench with Qwest, so
6 structure sharing was not occurring. In addition, along several of the feeder routes
7 where TESS was constructing their fiber capacity to feed these developments, there
8 was no other company interested in sharing the cost of this facility build.

9 **IV. CABLE PLACEMENT ACTIVITIES AS THEY RELATE TO STRUCTURE**
10 **SHARING**

11 **Q. PLEASE DESCRIBE THE CABLE PLACEMENT ACTIVITIES ASSUMED IN**
12 **LM3.**

13 A. LM3 specifically identifies the various construction activities that will be required, by
14 density zone as described in Mr. Buckley's testimony, to rebuild a network. For
15 example, the default placement inputs for the medium density zones (which would be
16 typical in suburban areas) in LM3 are:

- 17 • trench and backfill - 30%
- 18 • cut and restore concrete - 5%
- 19 • hand dig trench - 5%
- 20 • directional bore cable - 45%

- 1 • cut and restore asphalt - 10%
- 2 • cut and restore sod - 5%

3 Since construction will be required in areas that are already developed, Qwest would
4 be required to use a more expensive method of cable placement than if they were
5 placing facilities within a green field development. By having to place facilities in
6 an environment where multiple structures/obstacles already exist, the percentage of
7 directional boring would necessarily be far higher than if this was a new
8 development. As briefly noted in prior testimony, the use of directional boring, while
9 costly, may avoid the cost associated with digging up roads, sidewalks, yards, and
10 similar structures and restoring them to their original form.

11 **Q. IN YOUR EXPERIENCE, WOULD THE PERCENTAGES NOTED ABOVE BE**
12 **REALISTIC WHEN BUILDING A REPLACEMENT NETWORK?**

13 A. Yes. Since the new network would have to be built “around” all existing structures, it
14 would only make sense that the percentage of directional boring and cutting and
15 restoring asphalt would be higher than if these same facilities were being placed in a
16 new development.

17 **Q. WHY IS IT IMPORTANT TO UNDERSTAND THE INTER-DEPENDENCE OF**
18 **THESE VARIOUS CONSTRUCTION METHODS?**

19 A. When engineering a network as complex as that of Qwest’s or any other facilities
20 based telecommunication provider, it is critical to understand that decisions made in

1 the design and engineering of that network can not be made in a vacuum. Each
2 engineering decision carries with it an impact on the existing network. As such,
3 when using the LM3, if one input is modified and other inter-dependent inputs are not
4 also analyzed for possible modification, the results will not accurately represent the
5 construction activity that is required. For example, if the amount of directional
6 boring used in developed neighborhoods were reduced, the frequency of other
7 placing methods would have to be correspondingly increased. With a reduction in
8 directional boring, it is possible and indeed likely that another, more difficult and
9 costly method of placement, such as cut and restore asphalt, would be required to
10 account for the restoration activities and costs that directional boring avoids. If
11 adjustments to inputs are not made to reflect these alternative placement methods, the
12 cost estimates in a TELRIC model will not cover the costs an efficient carrier will
13 incur to construct a replacement network.

14 **A. BURIED ENVIRONMENT**

15 **Q. ARE THERE MULTIPLE METHODS FOR PLACING BURIED FACILITIES?**

16 A. Yes. There are two methods for burying cable facilities, buried and direct buried.

17 **Q. PLEASE DESCRIBE THESE METHODS AND HOW THEY WOULD IMPACT**
18 **THE OPPORTUNITIES FOR STRUCTURE SHARING.**

1 A. Buried cable is cable that is placed directly into the ground without using conduit or
2 inner-duct. Traditionally, this is done by digging a trench, placing cable within that
3 trench and then back-filling the trench.

4 Direct buried cable is buried cable that is placed directly into the ground through the
5 use of a specific piece of mechanical equipment, a vibratory plow, that literally
6 pushes the cable into the ground eliminating the need to open then backfill a trench.
7 This method of placing buried cable is typically used in areas where soil conditions
8 are relatively soft.

9 The direct buried method of placing cable is cost-efficient, since it avoids the costs
10 that are associated with digging and back-filling trenches. When the direct buried
11 method of placement is used, however, cost sharing is not a viable option since only
12 one facility at a time can be placed by a single entity using this placement method. It
13 is important to note that even without the ability to take advantage of the cost benefits
14 offered by structure sharing, this method of placement is considered cost-efficient
15 because the significant costs associated with trenching are avoided. In all of my
16 years of working in the field, I have never observed two utility companies
17 simultaneously placing facilities through the use of plowing and directly burying
18 cable.

19 As stated earlier, the only realistic opportunities for placing buried cable in shared
20 trenches occurs when building the distribution network in new developments where

1 construction is underway and timing permits it. In addition, as growth increases,
2 technology evolves and construction methods improve, it will be even less likely that
3 utility companies will deploy facilities at the same time – the recent upgrades to cable
4 TV networks is a perfect example of this. A proper cost sharing assumption for
5 buried cable should take into consideration the use of the direct buried method and
6 the lack of cost sharing opportunities that are available with this method.

7 **Q. WHAT CABLE PLACEMENT METHOD WAS UTILIZED IN THE**
8 **OVERBUILD EXPERIENCE YOU NOTED ABOVE?**

9 A. Qwest and TESS placed their cables into a trench where it was practical to dig a
10 trench. However, a substantial portion of the facilities were placed through
11 directional boring. Directional boring is utilized when placing facilities to avoid
12 disrupting both natural and man-made obstacles. In areas with these types of
13 obstacles, directional boring often is more cost efficient than having to pot hole and
14 hand dig multiple locations or replace/repair, portions, if not all, of the disturbed area
15 and obstacles, such as roads, driveways, sidewalks, lawns, and gardens. In the
16 overbuild, even some of the drops had to be placed via directional boring due to
17 obstacles such as driveways, sidewalks and landscaping.

18 **Q. WHAT AMOUNT OF COST SHARING DOES LM3 ASSUME FOR THE**
19 **PLACEMENT OF BURIED CABLE?**

1 A. Qwest's LM3 input relating to cost sharing assumes that a telephone company, on
2 average, will bear 80 percent of the costs of placing buried cable, while other utility
3 companies or developers will bear the remaining 20 percent.

4 **Q. ARE THESE ASSUMPTIONS IN LINE WITH YOUR EXPERIENCES WHEN**
5 **PLACING BURIED FACILITIES?**

6 A. Recent experience in the field confirms the reasonableness of Qwest's assumption
7 that the telephone company will pay, on average, 80 percent of the costs of placing
8 buried cables. As discussed above, in developed areas, it is very rare that another
9 utility company will be placing buried facilities at the same time as Qwest. As a
10 result, structure sharing is rarely an option in these areas and, thus, the telephone
11 company typically pays 100 percent of the cost for placing buried cables in these
12 areas.

13 **Q. IN THE ACTIVITY YOU HAVE EXPERIENCED AND WITNESSED, DOES 80**
14 **PERCENT ACCURATELY REPRESENT THE AMOUNT OF PLACEMENT**
15 **COST THAT QWEST IS RESPONSIBLE FOR?**

16 A. With the overbuilds and rehabilitation jobs I have participated in, for both TESS and
17 Qwest 80 percent accurately depicts the percent of time that these companies had to
18 place facilities into the route without having the ability to share cost with another
19 company.

1 **Q. WHAT WOULD THE RAMIFICATIONS BE IF THE SHARING ASSUMPTION**
2 **IN LM3 FOR BURIED CABLE WERE INCREASED?**

3 A. First, I do not believe it would be consistent with real-world experience or with a
4 TELRIC-based replacement network cost model to assume that a telephone company
5 would pay less than 80 percent of the costs of placing buried cable. But,
6 hypothetically, if Qwest were indeed paying less than 80 percent of the costs, one
7 would have to assume, to be consistent, that Qwest would be at the mercy of the
8 construction schedules and fiscal requirements of other utilities. This would include
9 delays due to scheduling and the potential of having equipment and personnel sitting
10 idle while waiting for each party's work to be completed. This approach and the delays
11 associated with it will increase the potential for facilities not being in place at the time
12 of demand. In addition to the timing issue, there is a resource issue. Qwest
13 construction forces are currently scheduled based on planned deployments of facilities,
14 which is efficient and cost effective. With construction schedules dependent on other
15 companies, it would be difficult at best to maintain those efficiencies.

16 **B. AERIAL ENVIRONMENT**

17 **Q. ARE AERIAL FACILITIES AS PREVALENT IN QWEST'S NETWORK AS**
18 **BURIED FACILITIES?**

19 A. No. In Washington, aerial cable accounts for 18.04% of the total cable sheath miles
20 located throughout the state. It is also standard engineering practice that, on a going
21 forward basis, buried facilities will be used whenever possible to replace existing

1 aerial plant. In fact, many local municipalities now prohibit the placement of aerial
2 facilities and in those areas where aerial facilities exist, additions or changes to the
3 facilities must be placed below ground. Mr. Buckley provides additional information
4 in his testimony relating to the reasons for the decreasing use of aerial plant. In my
5 experience, an efficient carrier rebuilding a network today would use minimal
6 amounts of aerial plant and certainly would not use more than the percentage of this
7 plant that Qwest has in place in Washington today.

8 **Q. DOES AERIAL PLANT PROVIDE THE SAME QUALITY OF SERVICE AS**
9 **BURIED AND UNDERGROUND PLANT?**

10 A. No. Aerial plant is prone to service interruptions caused by varying circumstances
11 related to its high degree of exposure. Examples of these circumstances are wind, rain,
12 lightning, squirrels, bullet and pellet damage, and auto accidents. While damage by
13 humans and wildlife is common, weather remains the major cause of service
14 degradation and interruption. Not only is localized weather damage possible because
15 of storms, but entire spans of aerial line may also topple during ice storms, blizzards, or
16 high winds. In rural areas, miles of aerial cabling may collapse when weighted down
17 with ice or snow. In addition, electrical lines damaged by harsh weather could, in turn,
18 damage telephone lines that share common poles. Weather damage is less likely to
19 occur with buried or underground plant because these cables are not exposed to the
20 elements. In addition, as mentioned, many communities are opposed to the use of
21 aerial plant because of aesthetic concerns.

1 **Q. WHAT IS THE PROPER AMOUNT OF COST SHARING FOR AERIAL**
2 **FACILITIES?**

3 A. An efficient carrier would incur approximately 50 percent of the total cost required to
4 place aerial facilities, which is consistent with Qwest's experience. In other words, it
5 is realistic to assume that Qwest will be able to share about 50 percent of the costs
6 associated with pole structures used to place aerial cable and other aerial facilities.
7 This engineering assumption is reflected in LM3.

8 **C. UNDERGROUND ENVIRONMENT**

9 **Q. WHAT ARE THE OPPORTUNITITES FOR STRUCTURE SHARING IN AN**
10 **UNDERGROUND ENVIRONMENT?**

11 A. The opportunities to share the costs of placing underground cable structure are quite
12 limited if any exist at all. It is infrequent that another telecommunications service
13 provider would want to share the cost of constructing a conduit system specifically
14 designed to facilitate the needs of the network when that telecommunications
15 provider can lease available duct space at a fraction of the construction cost. In
16 virtually every instance, Qwest assumes all of the responsibility of engineering,
17 constructing, maintaining and repairing its conduit structures.

18 In addition, the sharing of underground infrastructure between telephone and power
19 facilities is seldom done. AT&T's own Outside Plant Engineering Handbook states
20 "Joint trenching with power facilities should be employed only for distribution cables

1 and service wires, not for feeder or trunk cables.” AT&T’s own policy thus makes
2 clear that there is little, if any, real world opportunity for telephone and power
3 companies to utilize each other’s conduit. Complicating the issue, high voltage
4 associated with power lines poses a potential safety hazard to Qwest’s technicians
5 who are generally trained to work on low DC voltage circuits. In my many years of
6 outside experience, I have never seen electrical facilities residing in the same conduit
7 system with Qwest facilities.

8 **Q. WHAT IS THE AMOUNT OF STRUCTURE SHARING IN AN**
9 **UNDERGROUND ENVIRONMENT THAT IS REFLECTED IN LM3?**

10 A. LM3 properly reflects that cost sharing for conduit structures occurs no more than 5
11 percent of the time.

12 **V. FILL FACTORS**

13 **Q. HOW ARE FILL FACTORS USED IN ENGINEERING A**
14 **TELECOMMUNICATIONS NETWORK?**

15 A. Fill factors, also referred to as utilization levels, are used in the planning, engineering
16 and construction of any telecommunications network. By measuring the utilization
17 levels of its feeder facilities and monitoring the timeframe at which those levels are
18 expected to reach predetermined thresholds, an efficient carrier can anticipate the
19 need for, and timing of, augments to its network. Fill factors are also used as

1 indicators as to the efficient use of the existing network. The testimony of Mr.
2 Buckley provides detail as to LM3's treatment of fill rates.

3 **Q. PLEASE EXPLAIN WHY THE ENGINEERING ASSUMPTIONS MADE FOR**
4 **THE FEEDER PORTION OF THE NETWORK DO NOT APPLY TO THE**
5 **DISTRIBUTION FACILITIES.**

6 A. Distribution facilities are properly described as the connection between Qwest's
7 feeder network and the end user's location. The criteria used to plan, engineer, and
8 build distribution facilities are quite different from those used for the feeder network.
9 While the feeder network is sized to meet current demand plus reasonable projections
10 of growth in a wire center, distribution facilities are built to satisfy pair per site
11 criteria using actual developer sub-plats and/or municipal zoning. For example,
12 distribution facilities to a residential development of 50 single family units would be
13 sized to allow for at least two pairs per residence, or a total of one hundred pairs. Fill
14 factors are, thus, not used in the design of distribution networks. In addition, the
15 cable placements in the distribution network tend to be of a much smaller size (25
16 and 50 pair cables) and are often buried. Qwest's distribution network includes the
17 terminal and drop (buried or aerial service wire) to the customer.

18 **VI. QWEST'S DROP STUDY**

19 **Q. HAS QWEST CONDUCTED A STUDY FOCUSING ON AVERAGE FOOTAGE**
20 **OF DROPS IN THE STATE OF WASHINGTON?**

1 A. Yes it did. Qwest conducted a new drop study between January 1, 2002 and July 1,
2 2002 in order to develop a valid sampling of average drop length in urban, rural and
3 unmarked wire centers. In those six months, Qwest reviewed 5,731 drop forms and
4 documented footage readings to arrive at an average drop length for the state. The
5 contractor responsible for placement of these drops must document the footage placed
6 at each address in order to bill Qwest for their services. In urban wire centers, the
7 average length was 166 feet. In the rural areas, the average drop length was 254 feet
8 and in the unmarked wire centers, those where the contractor placing the drop did not
9 identify the wire center, the average length was 238 feet. The average drop length in
10 Washington for all surveyed drops is 183 feet. The study is included as Exhibit DP-2
11 and Confidential Exhibit DP-2C to this testimony.

12 **Q. WHAT TYPE OF VALIDATION PROCESS DID QWEST GO THROUGH TO**
13 **ENSURE THAT THE LENGTHS DOCUMENTED IN THE STUDY WERE**
14 **ACCURATE?**

15 A. Qwest conducted a sampling of these locations and where it physically located the drop
16 and then used a measuring wheel to assure that the lengths reported by the contractor
17 on the drop form were accurate. Qwest conducts spot-checks such as this when quality
18 inspections are done to verify accuracy.

19 **Q. OTHER STATES AND INTERVIENING PARTIES HAVE TAKEN ISSUE**
20 **WITH THE DROP STUDY CONDUCTED IN 1997 BY QWEST. HOW DOES**

1 **THAT STUDY ALIGN WITH THE RESULTS OF THIS MOST RECENT**
2 **STUDY?**

3 A. In reviewing both documents, I was not surprised that for the largest sample area (DG3
4 and urban wire centers), the average footages were within 10% of each other. In fact,
5 the newer study reflects longer lengths in this category.

6 **Q. IN OTHER COST PROCEEDINGS, YOU HAVE EXPRESSED SOME**
7 **CONCERNS ABOUT THE VALIDITY OF THE AVERAGE LENGTH. DOES**
8 **THIS NEWER STUDY RAISE THOSE SAME ISSUES?**

9 A. No, it does not. This study, unlike the first one, does allow and calculate drops in
10 excess of 500 feet into the overall average. In the previous study, any drop in excess of
11 500 feet was capped at 500 feet and then used to calculate an average length. This new
12 study considers actual length of all drops – this was not the case in the old study as the
13 500 foot cap rule was used. And unlike the earlier study, this new study captures actual
14 footage as documented on the drop placement form. I found the method used to
15 calculate earlier averages in the old study to be conservative since technicians would
16 have taken the most direct route between the house and the drop terminal resulting in a
17 shorter actual footage. The new study actually has the Qwest inspector locating the
18 drop and wheeling off the distance for a more accurate reading.

19 **Q. IN WASHINGTON, DOES QWEST USUALLY PLACE MULTIPLE DROPS TO**
20 **END-USERS IN MULTI-TENANT DWELLING UNITS?**

1 A. Not usually. In most instances, the builder runs the entire “bundle” of inside wiring to
2 a single location on the outside of the building. At that point, Qwest provides
3 connectivity to the Qwest network by running a single cable to a wall terminal to feed
4 all units. The minimum size of what I will call “black sheathed” cable is 25 pair. If
5 one were to consider an individual drop placed to each unit, a large number of these
6 shorter length drops would drive the average drop length down and not accurately
7 reflect Qwest’s “real” experience.

8 **Q. WHAT SHOULD BE CONCLUDED FROM YOUR TESTIMONY?**

9 A. I conclude that the drop lengths identified in Qwest’s recent in-depth drop study,
10 accurately reflect the average drop length in Washington. Furthermore, any attempt
11 to consider multiple drops into a multi-tenant building would only reduce the overall
12 average drop length and not allow Qwest to recover the cost for an average drop.

13 **VII. CONCLUSION**

14 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

15 A. Yes.