BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

IN THE MATTER OF THE CONTINUED COSTING AND PRICING OF UNBUNDLED NETWORK ELEMENTS, TRANSPORT AND TERMINATION	**)** **)** **)** **)** **)**	**DOCKET NO. UT 003013** **PART D**

DIRECT TESTIMONY OF

ROBERT J. HUBBARD

ON BEHALF OF

QWEST CORPORATION

NOVEMBER 7, 2001

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I. IDENTIFICATION OF WITNESS

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

A. My name is Robert J. Hubbard. I am employed by Qwest Corporation, as a Director in the Local Network Organization. My business address is 700 West Mineral, Littleton, Colorado 80120.

Q. BRIEFLY OUTLINE YOUR EMPLOYMENT BACKGROUND.

A. I am a Director of Technical Support in Qwest's Interconnection Strategies Group, the group responsible for the development of strategies to implement the unbundling of Qwest's network as required by the Telecommunications Act of 1996 ("the Act"). I provide technical support regarding unbundling issues to the Qwest Network and Public Policy departments.

I have over 33 years experience with two Regional Bell Operating Companies, Qwest and Indiana Bell Telephone Co. in their network departments. I worked for over 11 years at Indiana Bell and Qwest as a cable splicer and as a cable repairman involved in all aspects of splicing and repairing copper cables. At Qwest, I eventually moved from splicing and repairing into the engineering department as a design engineer for outside plant, designing copper and fiber facilities, and Analog and Digital Carrier Systems. I then went into the planning department as an outside plant planner, in which I planned for future jobs

involving fiber cable placement and upgrades to the existing outside plant network. In 1997, I moved into my present job as a Director in the Interconnection Planning Department.

I have had substantial involvement in Qwest's preparation for line sharing. For example, I studied possible network architectures in advance of Qwest's response to the FCC's First Report and Order and Further Notice of Proposed Rulemaking in CC Docket No. 98-147 ("Line Sharing Order"). Also, in Minnesota, I participated in the technical trials -- both the Lab and Field Tests -- that were ordered by the Minnesota Commission last year. During both the Lab and Field Tests, I provided technical and engineering input, and evaluated the outcome of the tests.

II. PURPOSE OF TESTIMONY

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR DIRECT TESTIMONY.

A. The purpose of my Direct Testimony is to address several issues that are raised in this cost proceeding. These issues are: Entrance Facilities, UDIT E-UDIT and Regeneration.

III. ENTRANCE FACILITIES

Q. PLEASE DESCRIBE FACILITY ACCESS AND COLLOCATION ENTRANCE FACILITIES.

A. A CLEC must have a method by which to connect its transmission facilities to its collocation within a Qwest central office. For virtual and physical collocations, a CLEC may choose from four options to obtain facilities access to its collocation. They are: 1) fiber entrance facilities; 2) purchase of private line or access services; 3) UNEs; and 4) microwave entrance facilities.

Qwest offers the following three fiber collocation entrance facilities options:

- **Standard Fiber Entrance Facility.** A standard entrance facility provides fiber connectivity between a CLECs fiber facilities as delivered to the collocation point of interconnection and the CLECs collocation space. A CLEC will deliver its fiber facilities to the collocation point of interconnection (C-POI) where Qwest will assist in the placement of the CLEC's cable into the C-POI and perform all splicing to the Qwest provided fiber entrance facility cable. This fiber entrance facility cable is taken into the Central Office where it is terminated onto a Fiber Distribution Panel (FDP). A fiber interconnection cable is placed from the FDP to the collocation space where it is handed off to the CLEC.

- **Cross-Connect Fiber Entrance Facility.** The cross-connect fiber entrance facility provides connectivity between a CLEC's fiber facilities as delivered to a C-POI, and multiple locations within a Qwest Central Office. A CLEC will deliver its fiber facilities to the C-POI where Qwest will assist in the placement of the CLEC's cable into the C-POI and perform all splicing to the Qwest provided cross-connect fiber entrance facility cable. This entrance facility fiber cable is then taken into the Central Office where it is terminated onto the first of two FDPs. A second FDP is connected, via fiber interconnection cables, to multiple locations within the Central Office and/or various types of equipment within the same Central Office. Cross-connections between the two FDPs are made with fiber interconnection cables, thus allowing access to multiple locations and types of equipment. This option provides flexibility in distributing fibers and readily supports applications where CLECs would require access to multiple points within one central office. A good example of this would be CLECs with multiple collocation spaces within a single Central Office.

- **Express Fiber Entrance Facility.** Qwest will place a CLEC-provided fiber cable from the C-POI directly to the CLEC's collocation space. This option is only available with a physical collocation. At the C-POI, Qwest will accept the CLEC fiber cable and continue placement of the cable through the Central Office to the CLEC collocation space where it is handed back to the CLEC.

This is an uninterrupted path with no splices or cross-connections. It is important to note that this option does not provide for any test access by Qwest and as such, the CLEC is fully responsible for the cable. In addition, this alternative is available only in wire centers with sufficient duct and innerduct capacity.

Q. IS THE C-POI ALWAYS A SEPARATE OR STANDALONE MANHOLE?

A. No. The POI manhole may be a separate manhole constructed for the CLEC's or it may be manhole 1 or 2 in the existing Qwest network.

Q. THE COMMISSION ADDRESSED COLLOCATION ENTRANCE FACILITIES IN PART A OF THIS DOCKET. WHY IS QWEST DISCUSSING THEM AGAIN?

A. Qwest is discussing entrance facilities again to establish the context for the issue that is required to be addressed in this Part D. In its Twenty-third Supplemental Order in Part A of this Docket, paragraphs 53 to 57, the Commission ordered Qwest to address additional questions related to CLEC access to the central office, particularly when Qwest's manhole 1 is congested.

Q. THE CLECS HAVE SUGGESTED THAT THEY BE ALLOWED TO BRING THEIR FACILITIES TO THE QWEST CENTRAL OFFICE AND SIMPLY BE ALLOWED TO CORE DRILL INTO THE QWEST

CENTRAL OFFICE VAULT. WILL YOU PLEASE RESPOND TO THIS SUGGESTION?

A. It is not as simple as just core drilling into the central office vault as suggested by the CLECs. Core drilling at various points into the central office raises significant safety concerns regarding gas seepage, which I will explain in this testimony. Designing the central office building and central office vault for the prevention of gas seepage is of the highest importance. Basically there are four harmful types of effects which must be considered – gases can be either explosive, toxic, irritating and/or suffocating. Although gases may enter the central office basement or vault area through cracks, holes, or the natural porosity of the building materials, gas seepage is more likely to occur through and around subsurface pipe and conduit penetrations, if these areas are not adequately sealed. It is Qwest's practice and policy that in order to prevent hazardous gases from entering the vault through telephone conduits, provision shall be made to route all underground conduits through gas venting chambers before terminating them in the vault. The more separate conduit runs there are, the more difficult and expensive this requirement would become.

Q. PLEASE EXPLAIN THE GAS VENTING CHAMBER.

A. The gas venting chamber is constructed to enhance the removal of both heavier and lighter-than-air gases from the conduit before its termination in the central office vault. Each conduit is perforated and runs through an enclosed chamber to

allow the internal gases to be vented to the outside atmosphere through vent pipes. The gas venting chamber must be designed to withstand the weight of subsoil and surface loads. In general, its walls, roof, and floor should be of reinforced concrete at least six inches thick. The size of the chamber is dependent upon the number of conduits entering the vault. Adequate width shall be provided in the construction of the vent chamber to provide for the termination of two 4-inch venting pipes and a 10-inch purge port. Thus, it is clear that simply performing another core drill into a central office is not a reasonable solution to the CLECs' concerns about occasional congestion at manhole 1. The CLECs will ultimately still have to bring their facilities through a common entrance into the building.

Q. PLEASE SUMMARIZE YOUR TESTIMONY ON ENTRANCE FACILITIES.

A. Qwest offers to the CLEC's three fiber collocation entrance facility options: standard fiber entrance facility; cross-connect fiber entrance facility; and express fiber entrance facilities. These options apply to caged and cageless physical collocation and virtual collocation. Fiber entrance facilities provide the connectivity between the CLECs' collocated equipment within the Qwest wire center and a collocation point of interconnection (C-POI), except to the express fiber entrance facilities option. With the entrance facility options that Qwest offers and the limitations for core-drilling into a central office vault, Qwest feels

that they can accommodate any and all entrance facility request that a CLEC would have.

Q. HAS QWEST DISCUSSED THIS ISSUE WITH XO OR THE OTHER CLECS FOR WHOM THIS ISSUE IS A CONCERN?

A. No, not yet. However, it is my understanding that Qwest and XO are trying to set up a meeting where these concerns can be discussed in more detail. If there is additional information to report after that meeting, the parties will advise the Commission.

IV. UDIT AND E-UDIT

Q. WHAT IS UNBUNDLED DEDICATED INTEROFFICE TRANSPORT ("UDIT")?

A. Unbundled Dedicated Interoffice Transport (UDIT) is an unbundled network element that provides an unchannelized transport channel between two Qwest wire centers or between Qwest end offices, serving wire centers or tandem switches in the same LATA and state. UDIT may also be used to provide a path between a CLEC in one Qwest wire center and a different CLEC in another Qwest wire center within the same LATA. UDIT consists of CLEC assignable channels that allow the transport of voice and/or data. These interoffice transport channels are available at Optical Carrier (OC), DS3, DS1, and DS0/Voice levels.

Optical Carrier includes OC-3 through OC-192 bandwidth and such high capacity as may evolve over time, where facilities are available. UDIT is a distance-sensitive, flat-rated bandwidth-specific interoffice transmission path designed to a DSX (Digital System Cross-connect frame) in each Qwest wire center. Specifications, interfaces, and parameters are described in Qwest Technical Publication 77389.

Q. WHAT IS EXTENDED UNBUNDLED DEDICATED INTROFFICE TRANSPORT ("E-UDIT")?

A. Extended Unbundled Dedicated Interoffice Transport (EUDIT) provides a bandwidth specific transmission path between the Qwest Serving Wire Center and a CLEC's wire center or an IXC's point of presence located within the same Qwest serving wire center area. EUDIT is available in DS1 through OC-192 bandwidths and such higher capacities as evolve over time where facilities are available. EUDIT is a flat-rated, bandwidth-specific interoffice transmission path.

It must be noted that the interface point distant from the Qwest central office must meet the following criterion to be considered a wire center:

- The location will have V&H coordinates (Vertical and Horizontal grid coordinates - AT&T Bell Labs assigned pair of numbers that locates each

telephone company's central office or rate center on a grid of the North American continent).

- The wire center contains switching equipment or a node leading to such a switch.
- The switch is registered with a CLLI code listed in the LERG.

Q. FROM A NETWORK ARCHITECTURE PERSPECTIVE, IS THERE A DIFFERENCE IN THE WAY UDIT IS PROVISIONED AS OPPOSED TO E-UDIT?

A. Speaking from the Network perspective, there is a substantial difference in the way a UDIT is provisioned as opposed to an E-UDIT, even though the end result looks deceptively similar.

Q. PLEASE ELABORATE ON THE DIFFERENCES IN PROVISIONING UDIT VERSUS E-UDIT.

A. UDIT, as previously stated, is a transport facility between two Qwest wire centers within a LATA. However, this is not simply a case of going from Point A to Point B, it is more likely it will be a case of going from Point A to Point Z via multiple points in between. As Qwest's inter-office network has evolved over time, it consists of long transport lengths between wire centers with high bandwidth capacities capable of handling the volumes of traffic between wire centers. In efforts to fully utilize these long, large transport "pipes," the concept

of alternate routes has developed between Qwest wire centers. It is possible to efficiently and economically transport traffic from one Qwest wire center to another Qwest wire center by "hopping" via multiple wire centers across the LATA utilizing the existing high bandwidth inter-office facilities rather than using a direct point to point route. UDIT may be provisioned using this alternate route concept. Exhibit RJH-9, Figure A is a graphical representation of how a UDIT is provisioned in this manner.

In contrast, E-UDIT is a transport facility that extends from a Qwest wire center to a CLEC wire center or IXC POP. As such, E-UDIT is somewhat geographically contained within the Qwest serving wire center to which it is connecting. In provisioning E-UDIT Qwest utilizes this wire center's existing loop facilities. The existing feeder and distribution loop network is migrated into service as makeshift inter-office facilities. In contrast to true inter-office facilities such as those between Qwest wire centers, inter-office facilities as they apply to E-UDIT are of substantially shorter length and can be provisioned as Point A to Point B with specific distances and bandwidth characteristics. In general, one path will exist, and alternate routes are the exception rather than the rule. Exhibit RJH-9, Figure B is a graphical representation of the provisioning of E-UDIT.

V. REGENERATION

Q. CAN YOU BRIEFLY EXPLAIN WHAT REGENERATION MEANS?

A. When cable runs become too long in a central office, the signal may become distorted and acquire noise during transmission. To eliminate the noise that has been created on the line, a repeater is installed which restores the signal to its original shape.

Q. DOES QWEST PROVIDE REGENERATION SERVICES FOR CLECs?

A. When Regeneration is required to restore a signal to its original shape, Qwest will provide this service to the CLECs.

Q. DOES QWEST CHARGE CLECS FOR REGENERATING A SIGNAL IN A CENTRAL OFFICE?

A. Depending upon the circumstances, when a CLEC requests collocation in a central office and Qwest places a CLEC in a collocation location that requires regeneration, Qwest would provide regeneration at no cost to the CLEC. In cases where the line meets or exceeds Qwest standards and the CLEC requests regeneration, the CLEC will be responsible for the charges associated with the regeneration of the line.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes it does.