BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Petition of Qwest Corporation To Initiate a Mass-Market Switching and Dedicated Transport Case Pursuant to the Triennial Review Order	**Docket No. UT-033044**

DIRECT TESTIMONY OF

RICHARD CABE

ON BEHALF OF

WORLDCOM, INC. ("MCI")

December 22, 2003

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EXHIBITS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE AS THEY PERTAIN TO THIS PROCEEDING.

A. I am an economist in private practice, specializing in economic analysis of regulatory matters in the telecommunications industry. I have presented testimony or depositions in matters concerning competition in the telecommunications industry to the public utility commissions of Alabama, Alaska, Arizona, Colorado, Florida, Georgia, Iowa, Kentucky, Louisiana, Mississippi, Nevada, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, Texas, Utah and Washington, before the Federal Communications Commission and Federal District Court. Until May of 1999, I was employed as Associate Professor of Economics and International Business at New Mexico State University. In that position, I taught graduate and undergraduate economics courses and arranged the telecommunications curriculum for conferences sponsored by the Center for Public Utilities. Over my last several years at the university, I offered graduate courses in Industrial Organization, Microeconomic Theory, Antitrust and Monopoly Power, Game Theory, Public Utilities Regulation, and Managerial Economics for MBA students. My experience with the telecommunications industry began in January of 1985 when I served on the staff of this Commission. During my employment at the Washington Commission, I served as a staff member to the Federal - State Joint Board in CC Docket No. 86-297. When I left the Commission staff to complete my doctoral degree, my title was Telecommunications Regulatory Flexibility

Manager. My consulting clients since I left the Washington Commission have included aspiring new entrants into local telecommunications markets, state commissions, and consumer advocates. My resume is attached as Exhibit RC-1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide the Washington Utilities and Transportation Commission ("Commission" or "WUTC") with recommendations for conducting its impairment analysis for the local switching Unbundled Network Element (UNE). MCI has asked me to provide the Commission with the proper economic framework for conducting its analysis consistent with the Federal Communications Commission's (FCC) directions in the *Triennial Review Order*. [1] In addition, I will present my market definition analysis, apply that market definition to the FCC's prescribed trigger analysis, and discuss the Commission's task evaluating the prospect of potential deployment.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I begin the substantive portion of my testimony with an analysis of the appropriate market definition for the Commission's investigation. Economic theory and practice, as well as the FCC's guidance in its *Triennial Review Order*, all suggest that the wire center is the most appropriate starting point for an analysis of whether CLECs are

[1] *See* Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carrier*, CC Docket No. 01-338, *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket No. 96-98, *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket No. 98-147, FCC 03-36, ¶ 495 (rel. Aug. 21, 2003)("*Triennial Review Order*" or "*Order*").

impaired without access to unbundled switching for mass-market customers. The following is a commonly accepted definition of wire center:

> This term is often used interchangeably with the terms central office and switch. Technically, the wire center is the location where the local exchange carrier terminates subscriber local loops, along with the testing facilities necessary to maintain them. A wire center can be a building or space within a building that serves as an aggregation point on a local exchange carrier's network, where transmission facilities and circuits are connected or switched. "Wire center" can also denote a building in which one or more central offices, used for the provision of exchange services and access services, are located.[2]

I also use the term "wire center" to describe the geographic area served by the loops terminating at a wire center. There are approximately 112 wire centers in Qwest's service area in the State of Washington with an average of about 21,000 loops in service per wire center.

Use of the wire center as the basic building block for analysis accomplishes the FCC's goals of a granular analysis that maximizes accuracy of results, subject to the constraints of practicality.[3] In addition, a wire-center market definition makes sense because the wire center is the place where the incumbent local exchange carrier's ("ILEC's") local switch actually resides and the wire-center boundaries accurately define the physical territory that at least some competitors or potential competitors might no longer be able to serve should the Commission find "no impairment" without access to unbundled local switching at any particular switch. Hence, a wire-center market definition is a practical choice as well.

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[2] *See* http://www22.verizon.com/wholesale/glossary/0,2624,W_Z,00.html.

[3] *Triennial Review Order* ¶ 130.

In contrast, a market definition based on a larger geographic area, such as the Metropolitan Statistical Area ("MSA"), creates a significant risk that trigger or potential deployment analyses based on such a market definition will result in a finding of no impairment in places where multiple, competitive supply does not exist today and is unlikely to occur in the foreseeable future.

I urge the Commission to adopt the wire center as the starting point for all subsequent impairment analyses. I also recommend that the Commission adopt a product market definition that includes all local exchange service options that provide service at a cost, quality and maturity equivalent to the ILEC's offerings. This product market definition should explicitly exclude Commercial Mobile Radio Service ("CMRS"), fixed wireless and cable telephony.

I next provide my analysis and recommendations for the Commission's trigger analyss. I recommend that the Commission conduct its trigger analysis (and any subsequent potential deployment analysis) in a way that evaluates whether (1) residential and small business customers should be treated as being in separate markets,[4] even at the wire-center level, and (2) whether customer locations served over integrated digital loop carrier ("IDLC") should be treated as residing in a separate submarket for which

[4] As I explain in detail later in this testimony, my suggestion that the Commission consider whether there are separate residential and small business markets is intended as a subdivision of the broader mass market, which the FCC has defined in light of the crossover between serving customers via voice-grade loops (which it calls DS0s) and serving them via high-capacity DS-1 loops. 47 C.F.R. § 51.519(d)(2)(iii)(B)(4). Selecting any specific, single breakpoint between mass market and enterprise customers is a complex endeavor requiring, at least, a zone-specific consideration of prices for different types of loop and associated customer premises equipment. MCI has not prepared such an analysis to date. After reviewing other parties' testimony and after pursuing additional information via discovery, however, MCI will comment on whether evidence supplied by other parties (singly or in combination) appears to form a viable basis for any specific breakpoint.

unbundled switching would continue to be available, even if a finding of no impairment were otherwise justified for the remainder of a given wire center. In any event, the Commission should take note of companies that are not actively providing residential service with their own switches (*i.e.*, companies that only provides business service). Such companies provide no evidence of actual mass-market entry, beyond the business segment they actually serve, and should not be counted in the Commission's trigger analysis as instances of actual entry that provide evidence of overcoming barriers to entry that have not, in fact, been overcome.

The FCC has made a national finding of impairment with respect to mass-market switching.[5] The Commission should not find that the trigger requirements have been satisfied unless and until the Commission determines that all mass-market customers in that market have a real and current choice among three carriers who are providing local service via their own switching using the ILEC loop plant.

Pursuant to the rules set forth by the FCC in the *Triennial Review Order*, a carrier can only be considered as a triggering company for mass-market switching if it meets specific requirements in the following four areas: (1) corporate ownership; (2) active and continuing market participation; (3) intermodal competition; and (4) scale and scope of market participation. Applying these criteria rigorously in a properly defined market is essential to ensuring that "[i]f the triggers are satisfied, the states need not undertake any further inquiry, ***because no impairment should exist in that market***."[6]

[5] *Triennial Review Order* ¶ 459.

[6] *Id.* ¶ 494 (emphasis added).

At this point, I have not identified any wire centers in Qwest's service territory for which I believe that either the wholesale or retail trigger has been met. I will, however, respond to Qwest's trigger-based claims of no impairment in my Round 2 testimony. At that time, I will also identify whether there are any "exceptional circumstances" that would warrant overriding a finding of no impairment, if in fact such finding were justified based on the evidence.

Finally, I provide my analysis and recommendations for the Commission's potential deployment analysis. In the absence of clear evidence of no impairment in the form of actual self-provisioning by CLECs that satisfies the "bright-line rule" of the FCC's prescribed trigger analysis, the analysis may proceed to the possibility of potential deployment to test whether barriers to entry without unbundled access to a network element are "likely to make entry into a market uneconomic," or whether the market in question is "suitable for 'multiple, competitive supply.'"[7] This analysis must be conducted on a market-by-market basis, analyzing the same markets that are used in the trigger analysis. At this stage of the analysis, the Commission must consider any local switching capacity of market participants identified in the trigger analysis in concert with analysis of operational and economic barriers to entry.

In concert with analysis of operational barriers and any actual entry, an analysis of potential deployment evaluates CLEC costs and anticipated revenues to determine whether CLEC operations without access to unbundled local switching is likely to be profitable and support multiple competitive entry. My testimony provides a detailed discussion of the types of costs and revenues that the Commission should consider in a

potential deployment analysis. MCI has developed a model to evaluate the prospects for potential deployment, based on extensions of the NRRI model prepared by David Gabel, Eric Ralph and Scott Kennedy.[8] I was unable to complete the Washington-specific implementation of that model in time for this filing, but I will discuss recommendations related to the application of similar models.

The remainder of my testimony explains the basis for each of these conclusions and recommendations.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. This introductory section (Section II) places the issues in this proceeding into context. The body of my testimony is organized to correspond to the two-step analytical process outlined by the FCC. The first of these steps encompasses market definition and analysis of triggers, which I address in that order (Sections III and IV of my testimony, respectively). The second step pertains to "post-trigger" analysis and is split into two sub-steps, the first of which addresses further inquiry into markets where there is a claim that triggers are satisfied (Section V.A of my testimony) and the second of which addresses the analysis of potential deployments in markets where triggers are not satisfied (Section V.B of my testimony). I present my conclusions in Section VI.

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[7] *Id.* ¶¶ 84, 506.

[8] *An Approach to Analysis of Impairment of Unbundled Switching*, by David Gabel, Eric Ralph, and Scott Kennedy, available at http://www.nrri.osu.edu/members/markets/Impairment/index.php.

II. IMPAIRMENT ANALYSIS – INTRODUCTION

Q. WHAT IS YOUR UNDERSTANDING OF THE FOCUS OF THIS PROCEEDING?

A. In this docket, the Commission must determine whether CLECs would be impaired in the State of Washington in providing telecommunications services to mass market customers in the absence of unbundled local switching from the ILEC. The FCC found that CLECs are impaired on a national basis without unbundled access to the ILECs' switching facilities; however, at the same time, the FCC permitted the ILECs to attempt to identify areas, on a market-by-market basis, and seek to overcome those national impairment findings. Qwest has indicated, at least as a preliminary matter, that it intends to challenge the FCC's national impairment findings in its entire service area in Washington.[9] However, unless and until Qwest can demonstrate in a particular market that CLECs are not impaired without access to unbundled switching for mass market customers, the FCC's national impairment finding cannot be reversed.

The Telecommunications Act of 1996 ("Act") and the *Triennial Review Order* provide certain criteria for the Commission's determination, but it is up to this Commission to interpret the applicable statutes, policies and rules, and determine whether Qwest has overcome the national impairment finding for mass market switching in particular markets.

The *Triennial Review Order* affords two routes to attempt to make that showing. First, Qwest can attempt to show that there is "actual deployment" of mass market switching in a particular market. The actual deployment test has become known as the

the "trigger" test. The *Triennial Review Order* provides for two triggers—the "self-provisioning trigger" and the "competitive wholesale facilities trigger." If either trigger is met in a particular market, then the CLECs are not to be considered impaired without mass market switching in that market.

If there is not sufficient actual deployment to justify reversal of the FCC's national finding, Qwest can attempt to show that conditions are appropriate for "potential deployment." The potential deployment test evaluates feasibility of entry to determine whether a market is "suitable for 'multiple competitive supply.'"[10] In this proceeding, the Commission will examine whether these deployment tests of the *Triennial Review Order* have been met.

The *Triennial Review Order* provides for two triggers—the "self-provisioning trigger" and the "competitive wholesale facilities trigger." If either trigger is met in a particular market, then the CLECs are not to be considered impaired without mass market switching in that market. Therefore, the Commission has four critical tasks in this proceeding: (1) identify the geographic and product markets in which it will conduct its impairment analyses; (2) determine the breakpoint between mass market and enterprise customers; (3) determine whether the actual deployment test, or trigger test, is satisfied in any geographic markets such that non-impairment is demonstrated; and (4) determine whether, despite the absence of actual entry that reaches the threshold of the trigger

[9] Petition of Qwest Corporation to initiate a Nine-Month Case Under the Triennial Review Order (hereinafter "Petition"), p. 15, l. 16.

[10] *Triennial Review Order* ¶ 506.

analysis, some markets may be "suitable for 'multiple competitive supply,'" and no impairment is demonstrated in accordance with the potential deployment test.[11]

Unbundled local switching is a key component of the unbundled network element ("UNE")-Platform, or UNE-P, through which MCI and other carriers have begun to provide competitive mass market alternatives to the ILECs' monopoly local services; a "no impairment" finding by the Commission in this docket will remove that avenue of competition in the affected geographic markets. Therefore, the stakes in this proceeding are high. If the Commission makes a premature finding of "no impairment" the result could be to completely undermine the future of mass market competition in Washington.

Q. DO YOU HAVE ANY GENERAL, OVERALL GUIDANCE FOR THE COMMISSION AS IT BEGINS ITS IMPAIRMENT ANALYSIS?

A. Yes. I provide specific guidance throughout this testimony, but there are really two central questions upon which the Commission should focus. The first applies to the Commission's trigger analysis. The question here is whether retail mass-market customers in a market have a real and current choice between three carriers providing local service via their own switching facilities using the ILEC loop plant.[12] Only if the answer to that question is a very clear "yes" should the Commission consider "pulling" the mass market switching self-provisioning trigger. The second question applies to the Commission's potential deployment analysis. Here, the Commission should find no impairment only if it can be very confident that the current state of operational and

[11] *Id.*

[12] There is a second, wholesale, trigger, but consistent with the FCC's findings in the *Triennial Review Order* (¶ 442), and Qwest's Petition initiating this proceeding (p. 16, l. 4) I do not expect the wholesale trigger to play a role in this proceeding.

economic barriers to serving all the mass-market customers in a market are such that the market is now "suitable for 'multiple competitive supply.'"[13]

A. Impairment Must Be Decided within the Specific Context of the Industry, the Act, and the FCC's Implementing Rules.

Q. WHAT ARE THE ESTABLISHED GOALS OF THE ACT THAT PERTAIN TO THIS PROCEEDING?

A. The Preamble to the Act identifies its purpose as being "[t]o promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies." The FCC has recognized that the role of UNEs in achieving the Act's goals is to facilitate the opening of local markets to competition.[14] Thus, any impairment analysis must recognize the role that UNEs play in ensuring Washington mass-market customers have competitive options for local service.

Q. HOW ARE CLECS CURRENTLY SERVING MASS MARKET CUSTOMERS?

A. The Act sets a framework for local competition and provides for three vehicles of market entry: [15]

(1) Total service resale priced at the incumbent's retail prices less an avoided cost discount;

(2) Unbundled network elements (including UNE-P) priced at forward-looking economic cost; and

(3) Facilities-based entry.

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[13] *Triennial Review Order* ¶ 506.

[14] *Triennial Review Order* ¶139.

[15] 47 U.S.C. § 251(c).

Although a handful of mass-market customers have obtained local service either through a competitor that resells the incumbent's retail local service offering or through facilities-based carriers that provide their own unbundled switching, the vast majority of mass-market customers today on a nationwide basis who have obtained local service from a competitive carrier do so from a UNE-P provider.

For example, it is my understanding that MCI began offering residential local service in December 1998, in New York, and today MCI offers local service on more than 3.5 million lines in the 48 contiguous states, all via UNE-P. Last year MCI launched its landmark bundled product, The Neighborhood, providing customers with all-distance service (local and long distance) for one flat price, the first product of its kind to be mass marketed across the country. This year, MCI has added Digital Subscriber Line ("DSL") service where available to The Neighborhood, so that customers can receive local, long distance and data service from the same carrier all for one flat price. The Neighborhood is currently provisioned exclusively via UNE-P and, where DSL service is offered, through line splitting.

On a nationwide basis, a much smaller number of customers subscribe to local service from competitors that combine their own switches with the incumbent's UNE loops (a "UNE-L" facilities-based provider). Still others obtain service through some form of intermodal competition, such as cable telephony.

Q. HOW WILL THE COMMISSION'S DECISIONS IN THIS PROCEEDING AFFECT COMPETITION?

A. As I mentioned above, the vast majority of mass market customers being served by CLECs are being served via UNE-P. Therefore, the Commission's decisions in this

proceeding will determine whether mass-market customers across the state who are just beginning to explore their competitive options will continue to have meaningful alternatives to the incumbent's local service. Moreover, he decisions the Commission makes in this proceeding will directly affect the ability of CLECs to compete with the ILECs' bundled offerings of broadband and narrowband services.

More and more, competing telecommunications providers are offering consumers *bundles*, such as MCI's "The Neighborhood," that combine local, long distance, and Internet services, rather than marketing these services individually. And more and more, consumers are opting for "one-stop shopping," buying bundled services from a single provider. The increasing popularity of bundling—and the ILEC's ability to provide a complete bundle of services—makes viable local competition an essential precondition for preserving competition in the long distance and Internet services markets.

The strong consumer demand for bundled products puts a monopoly provider of local service in a good position to leverage its monopoly into other services. ILECs stand poised to dominate the long-distance market, or at least the portion of the market characterized by customers who prefer to purchase bundled products.

Supply-related considerations also encourage the creation of service bundles and provide the ILECs with potential monopoly power. For example, ILECs are adding broadband capability to the steadily increasing percentage of lines served via fiber feeder and Digital Loop Carrier ("DLC"). At the ILECs' urging, the FCC has eliminated any requirement for incumbents to provide competitors with unbundled access to the newly

added capabilities of their fiber-fed loops.[16] This strategic management of technology allows ILECs to bundle narrowband and broadband services for the millions of customers served over fiber-fed loops in a manner that competitors cannot readily replicate.

This is no accident. ILECs are well aware that customers who obtain their broadband Internet access and their local service from a single provider are more "sticky"—*i.e.*, they are less likely to switch carriers. For example, consistent with a growing conventional wisdom in the industry, SBC recently announced that:

- Adding long distance to an access line reduces the company's churn rate by 9 percent.
- Churn drops by 61 percent when a DSL line is added to an SBC bundle.
- Together, long distance and DSL reduce churn by 73 percent.[17]

Thus, the inability to match the ILECs' bundle of broadband and narrowband services will put CLECs at a severe disadvantage not only as potential providers of broadband service, but also as competitors for basic voice-grade local and long-distance services.

Q. HOW DOES THE OBJECTIVE OF ENCOURAGING FACILITIES-BASED COMPETITION FIT INTO THIS OVERALL INDUSTRY AND POLICY CONTEXT?

A. In non-regulated competitive markets, there are many different viable firm structures, ranging from firms that specialize in retailing (pure resellers) to firms that own and control every step of the process from the extraction of raw materials to the sale of

[16] *Triennial Review Order* ¶ 288.

[17] SBC Press Release, "SBC Communications Provides Progress Report on Major Growth Strategies, Outlines Broad Service and Cost Initiatives," (Nov. 13, 2003), a copy of which is provided in Exhibit RC-2.

finished goods and services. There is no single optimal level of what economists call vertical integration.

The ILECs themselves have altered their levels of vertical integration over time. For example, pre-divestiture, the Bell System was a vertically integrated amalgam of a research and development arm (Bell Labs), an equipment manufacturer (Western Electric), facilities-based local service providers (the various local operating companies, which were spun off as the RBOCs) and a facilities-based long distance provider (AT&T Long Lines). Post-divestiture, the RBOCs have become resellers of other manufacturers' equipment, have spun off their own jointly owned and operated research and development arm (the former BellCore, now Telcordia) and have chosen to re-enter the long-distance business primarily by leasing facilities from other carriers.

The last example is particularly instructive. The ILECs are mostly *not* building their own nationwide long distance networks; instead, they are relying on renting others' networks out of region on competitive terms. Yet, in contrast to their advocacy concerning local entry via UNE-P, the ILECs have vigorously argued before state and federal regulators that their entry into the long-distance business will deliver significant consumer benefits, even though they rely extensively on others' facilities.

The ILECs are able to compete fully in the long-distance retail market without building their own nationwide networks because, prior to their entry, the long-distance *wholesale* market was already well-established. The Operations Support Systems ("OSS") were already designed to accommodate multiple carriers using the same networks, and price competition had driven wholesale prices well below historic/embedded costs.

CLECs should have the same opportunity to procure network inputs at competitive prices. But, in stark contrast to the long-distance wholesale market, where there are multiple carriers from which the ILECs can obtain capacity, CLECs generally have no choice but to lease facilities from the former local monopolist in each area. This is because, as the FCC has found on a national basis, CLECs are economically and operationally impaired without unbundled access to the unbundled elements that comprise the UNE-P. In particular, with respect to mass market switching, the FCC found that CLECs are impaired on a national basis based on the ILECs' hot cut process, and the FCC found a number of other impairments that may be present and need to be examined on a market-by-market basis. As MCI witnesses Cedric Cox and Mark Stacy explain in detail, even if a competitor already has a switch in Washington, there are many layers of operational issues that may prevent the competitor from using that switch to serve mass-market customers in the same wire centers in which it is already offering service to large business customers – let alone extending service to mass-market customers in any other wire centers.

Not only do the ILECs have little incentive to offer potential competitors favorable wholesale prices, they also have been slow to develop systems that truly facilitate use of their networks by multiple carriers. Absent a continued requirement to make UNE-P available at prices based on forward-looking economic cost – a requirement that remains in place unless and until the economic and operational impairments preventing UNE-L competition are all resolved – the ILECs can, and undoubtedly will, exploit their monopoly leverage over local networks to forestall competitive entry, which

in turn denies consumers competitive choices. Such an outcome cannot be good for Washington's residential and small business customers.

B. State Impairment Decisions Must Begin with the *Triennial Review Order*'s National Impairment Findings Concerning Mass-Market Switching.

Q. PLEASE DISCUSS THE FCC'S NATIONAL IMPAIRMENT FINDINGS WITH RESPECT TO MASS MARKET SWITCHING.

A. The FCC found that on a national basis—in central offices big and small, in urban and rural areas—CLECs are impaired without unbundled access to mass market switching.[18]

Q. WHICH END-USER CUSTOMERS DID THE FCC INCLUDE UNDER THE HEADING OF MASS-MARKET CUSTOMERS FOR PURPOSES OF ITS ANALYSIS OF UNBUNDLED SWITCHING?

A. The FCC has defined mass-market customers to include all residential customers as well as very small business customers.[19] The FCC did not identify a specific cutoff for the size of businesses considered to be part of the mass market.

Q. WHAT WAS THE BASIS FOR THE FCC'S NATIONAL FINDING OF IMPAIRMENT FOR MASS-MARKET SWITCHING?

A. The FCC explained that its national impairment finding is based on the ILECs' hot cut processes. The FCC found that the ILECs' hot cut processes on a national basis are insufficient to handle mass market volumes economically and without disruption to the customer. The FCC specifically stated:

> This finding is based on evidence in our record regarding the economic and operational barriers caused by the cut over process. These barriers include the associated non-recurring costs, the potential for disruption of service to the customer, and our conclusion, as demonstrated by our

[18] *Triennial Review Order* ¶ 459.

[19] *Id.* ¶ 127.

> record, that incumbent LECs appear unable to handle the necessary volume of migrations to support competitive switching in the absence of unbundled switching. These hot cut barriers not only make it uneconomic for competitive LECs to self-deploy switches specifically to serve the mass market, but also hinder competitive carriers' ability to serve mass market customers using switches self-deployed to serve enterprise customers.[20]

Q. IF IMPAIRMENT RELATED TO THE HOT-CUT PROCESS VANISHED TOMORROW, WOULD THAT ELIMINATE ECONOMIC AND OPERATIONAL BARRIERS TO ENTRY FOR MASS-MARKET SWITCHING?

A. No. As Mark Stacy and Cedric Cox explain in their accompanying testimonies, even if the hot-cut process were perfected (without an increase in costs to potential competitors), there are many other operational and technical issues that a switch-based provider of local exchange service must overcome. In addition, there are a host of economic barriers to entry that could be significant in particular markets, as I discuss at length in Section V.B of my testimony.

Q. DID THE FCC IDENTIFY ANY ISSUES OTHER THAN THOSE RELATED TO HOT CUTS THAT COULD LEAD TO A FINDING OF IMPAIRMENT FOR MASS-MARKET SWITCHING?

A. Yes. The FCC identified several additional operational and economic factors that could cause impairment, and specifically directed states to consider these factors in their deliberations, stating:

> We ask states to examine evidence of sources of impairment other than hot cuts, in the manner we describe below, as the record shows that requesting carriers may be impaired without access to unbundled incumbent LEC local circuit switching because of operational and economic factors other than those associated with hot cuts. Commenters have alleged that these barriers – which include poor incumbent LEC performance in fulfilling unbundling, collocation, and other statutory obligations, difficulties in

[20] *Id.*

> performing customer migrations between competitive LECs, difficulties in performing customer migrations between competitive LECs, difficulties in performing collocation cross-connects between competing carriers, and the significant cost disadvantages competitive carriers face in obtaining access to the loop and backhauling the circuit to their own switches – can be sufficient to hinder or prevent entry even if impairment caused by hot cuts were fully resolved. Although these factors *do not* form the basis of our national impairment finding, we recognize that the record evidence indicates that these factors may give rise to impairment in a given market, even setting aside the problems associated with hot cuts, and that they therefore will be relevant to state commissions' determinations with respect to unbundled local circuit switching.[21]

In its deliberations, the Commission should be aware of the various sources of impairment that Qwest will claim have been overcome by "triggering" carriers. The accompanying testimonies of Mr. Cox and Mr. Stacy, along with my testimony, provide the necessary context for the Commission's review of claims of no impairment based on trigger analyses. The Commission should take particular care to ensure that any carrier claimed as counting toward the retail or wholesale trigger demonstrates, through its actual marketplace participation, that it has overcome the economic and operational barriers to entry that the FCC identified. A carrier whose mass-market operations are trivial in scale and scope is not a carrier that demonstrates these significant barriers can be overcome.

[21] *Id.* ¶ 476.

C. The Commission's Tasks

Q. WHAT DECISIONS MUST THE COMMISSION MAKE IN THIS PROCEEDING? WE HAVE ALREADY COVERED THESE TWO Q AND A WITH OUR FOUR CRITICAL TASKS, AND THE ANALYSIS THAT COMES AFTER. DO YOU THINK THAT WE COULD GET AWAY WITH DELETING THE NEXT COUPLE OF PAGES??

A. Although the FCC made a national finding that CLECs are impaired without unbundled access to ILEC local switching to serve mass-market customers,[22] it delegated to this Commission the task of determining whether the national finding of impairment is overcome in any areas within Washington. Specifically, the FCC "ask[ed] the states to assess impairment in the mass market on a market-by-market basis."[23] The Commission must conduct a market-by-market investigation into whether existing barriers to entry for mass-market switching "are likely to make entry into a market uneconomic."[24]

Q. PLEASE DESCRIBE THE PROCESS THE COMMISSION SHOULD FOLLOW IN REACHING THESE DECISIONS.

A. The first step in the analytical process, logically, is to define the markets in which the Commission will consider evidence of impairment on a "market-by-market" basis.[25]

The Commission must further define the market by identifying a demarcation between the very small businesses that the FCC has included under the umbrella heading of "mass-market customers" and the larger businesses that the FCC has identified as "enterprise customers."

[22] *Id.* ¶ 419.

[23] *Id.* ¶¶ 476 and 493.

[24] *Id.* ¶ 84.

[25] *Id.* ¶ 495.

I recommend that the Commission adopt a market definition that permits the most unambiguous and accurate answer to the question of whether CLECs are impaired without access to unbundled switching in a given market. Implicitly, therefore, every step of the subsequent analysis should allow the Commission to assess whether there is evidence that demonstrates the basis for the national finding of impairment does not apply in a specific defined market. I discuss this point in more detail below.

Once the Commission has defined the relevant markets, the FCC expected that it would then "identify where competing carriers are not impaired without access to unbundled switching, pursuant to the triggers and analysis of competitors' potential to deploy."[26] The Commission must conduct all trigger and potential deployment analyses on a market-by-market basis, and the FCC has specified that states must use the same market definition in conducting both analyses.[27] I elaborate below on the process that the Commission should follow in its "trigger" analyses, and I present an analysis of potential deployment applied to Qwest's Washington wire centers.

Finally, if the Commission does determine that a finding of no impairment is justified in one or more markets on the basis of a trigger analysis, it then may consider evidence of exceptional circumstances that would merit a waiver of any such finding.

[26] *Triennial Review Order* ¶ 473.

[27] *Triennial Review Order* ¶ 495.

D. Decision Criteria

Q. WHAT ARE THE CONSEQUENCES OF THE TWO POSSIBLE OUTCOMES OF THE COMMISSION'S DECISION REGARDING SATISFACTION OF THE TRIGGERS IN A GIVEN MARKET?

A. When considering evidence as to whether the triggers are satisfied in a particular market, the Commission should bear in mind the consequences of the two alternative outcomes. If the Commission finds three qualifying self-provisioning CLECs in a market, suitably defined, who are actively serving mass market customers within the market, a finding of no impairment is required.[28]

I have explained that if the Commission properly defines the geographic market in this case, it will logically follow that a finding that the trigger analysis has been satisfied will mean that all (or substantially all) customers in the market have a real and current choice between three self-provisioning CLECs using ILEC loop plant. Thus, before completing its trigger analysis, the Commission should specifically ask itself whether this is the case. Unless and until the answer to that question is unambiguously yes, the Commission cannot and should not find the trigger tests to be satisfied. If the Commission were to do otherwise and pull the trigger in a market prematurely, many customers would likely have no realistic competitive choice to the monopoly ILECs' offerings.

In contrast, if the Commission's trigger investigation fails to demonstrate that customers have a real and current choice of three self-provisioning competitive carriers using the ILEC loop plant, and that therefore the FCC's impairment finding is not

reversed within a market, the consequence is simply that the investigation may proceed to the more detailed analysis of potential deployment, as called for in the *Triennial Review Order*. This more detailed analysis affords the Commission a better chance of being certain that a finding of no impairment will truly be in the interest of Washington consumers, while at the same time providing ample opportunity to find no impairment if none exists. Hence, there is little downside—and a substantial upside—to a decision that the triggers do not justify a finding of no impairment.

For all of these reasons, I urge the Commission to conduct any trigger analyses in a manner that errs on the side of caution in protecting the interests of Washington consumers. Any decision to overturn the national finding of impairment for mass market switching should rest on incontrovertible evidence that competitive carriers will indeed be able to offer Washington's residential and small business customers with competitive choices, even without access to UNE switching.

Q. WHAT WOULD BE THE CONSEQUENCES OF REVERSING THE FCC'S NATIONAL IMPAIRMENT FINDING?

A. The consequences of reversing the FCC's impairment finding are very different from the consequences of the alternative, both at the stage of the trigger analysis and in the analysis of potential deployment. A finding of no impairment, at whatever stage of the analysis, initiates a process of upheaval in the local exchange market for virtually all parties involved: end-users, CLECs and even the ILECs, who will suddenly be confronted with the challenge to cut-over mass-market volumes of customers, a challenge

[28] The FCC does, however, provide for the Commission to seek a waiver of the finding of no impairment based on exceptional circumstances, such as the lack of additional collocation space in a particular central office. *Triennial Review Order* ¶ 503.

for which they are ill prepared. Conversely, a decision that the available evidence does not overcome the national finding of continued impairment is a provisional finding at whatever stage of analysis it is made.

Q. IN WHAT SENSE IS A DECISION TO UPHOLD THE EXISTING FINDING OF IMPAIRMENT "PROVISIONAL?"

A. Whenever the Commission determines that the available evidence does not overcome the national finding of continued impairment, that determination is always subject to being revisited. Even if at the end of this nine-month proceeding the Commission determines that the national impairment findings have not been overcome, the *Triennial Review Order* directs that the states should conduct a continuing market-by-market review of impairment, upon petition of a requesting carrier pursuant to prescribed state procedures.[29] Further, the *Triennial Review Order* recognized that reducing barriers to entry will result in more deployment of CLEC switching facilities, and state commissions will, as a matter of course, increasingly find no impairment in subsequent reviews.[30]

Q. WHAT ARE THE CONSEQUENCES OF A PREMATURE FINDING OF NO IMPAIRMENT?

A. A finding of no impairment will initiate a period of substantial changes in the market, both for consumers and for providers, whether the finding is well-founded or premature. Many CLECs will likely be forced to change their business plans and focus on other parts of the markets, *e.g.*, serving enterprise customers. If the finding is premature many, if not all, CLECs will exit the market and consumers will be left with

[29] *Triennial Review Order* ¶ 526.

[30] *Id*. ¶ 502.

few or no alternatives to Qwest. Although it is conceivable that the CLECs could reenter the market if technological advancements improve the prospect of earning profits, this may not happen for some time. Furthermore, once a CLEC exits the market, it will face a significant new barrier to entry—the cost of establishing a brand name and acquainting a new generation of customers with a competitive local telecommunications market.

Q. IS IT APPROPRIATE FOR THE COMMISSION TO CONSIDER THE EFFECTS OF A FINDING OF NO IMPAIRMENT AND OF THE PROVISIONAL CHARACTER OF A FINDING THAT THE EVIDENCE DOES NOT YET OVERCOME THE NATIONAL FINDING OF CONTINUED IMPAIRMENT?

A. Yes. In fact, I believe it would be a grave error for the Commission *not* to consider these implications of its decisions. In particular, the Commission should recognize, and attempt to minimize, the consequences of the two kinds of decision-making errors that are possible in this proceeding.[31]

First, the Commission could prematurely reverse the FCC's national finding of impairment in a market when, in fact, CLECs continue to be impaired. (This would constitute what statisticians call a "Type I" error.) As I noted above, such a decision would do severe harm to the prospects for local exchange competition in Washington and would therefore deprive mass-market consumers in Washington of the benefits of such competition. Moreover, with the increasing prevalence of bundling, any decision that impedes local exchange competition will have spillover effects in the long-distance market. Long distance carriers that are unable to offer a bundled local/long-distance product will find it difficult to survive in the marketplace. This could lead to an outcome

[31] While all parties wish for the Commission to make the "right" decision, errors are possible, and formal analysis of decision-making properly focuses on the consequences of these errors.

where there are few or no alternatives to the ILEC for long distance and local service. Washington consumers could lose the benefits of the long-distance competition that they have enjoyed for many years. Furthermore, the relevant bundle now includes DSL service, and the Commission should consider in its analysis the impairments that would hinder a CLEC's offering of DSL service in a UNE-L environment.

The other possible error would be to uphold the FCC's national impairment finding when, in fact, CLECs are not impaired. (This would constitute what statisticians call a "Type II" error.) Very much in contrast to the error of mistakenly finding no impairment, there is a good chance that erroneously upholding the FCC's impairment finding where no impairment exists would be a short-lived self-correcting error. If CLECs are not impaired without access to UNE switching, I would expect more CLECs to self-provision switching in the relatively near future. The number of self-provisioning carriers will consequently increase until the three-carrier retail trigger is met. Qwest would certainly bring this fact to the Commission's attention for its consideration in continuing review of the status of impairment.

Decision theorists use a "loss function" to capture the perceived cost of each type of error. The loss function quantifies the cost, in terms of lost societal (both consumer and producer) welfare, incurred for a given regulatory action and a given set of facts about CLECs' true ability to enter without access to unbundled switching. Because a false finding of no impairment would cause irrevocable harm, whereas a false finding of impairment has only temporary consequences, the cost to society of the former (Type I) error is far greater than the cost of the latter error.

Q. WHAT DO YOU EXPECT WILL HAPPEN OVER TIME IN MARKETS FOR WHICH THE COMMISSION FINDS IMPAIRMENT TO EXIST TODAY?

A. Insofar as existing barriers to entry diminish in importance, I expect that the increasing provision of service via UNE-L will naturally create a body of evidence supporting a finding of no impairment in a growing number of markets. A determination that the evidence for a particular market does not yet overcome the national finding of continued impairment is always provisional in the sense that the Commission can always revisit the state of evidence in that market and make a finding of no impairment as soon the level of actual or potential facilities-based competition in that market justifies such a finding.

The ILECs will be aware that, if they work diligently with the Commission and other parties to reduce existing barriers such as the cost and operational difficulties associated with the hot cut process, including both hot cut procedures and costs, findings of no impairment will happen sooner rather than later. This creates appropriate incentives for the ILECs to be part of the solution, rather than part of the problem.

Q. YOU STATED ABOVE THAT GROWTH IN UNE-L BASED SERVICE WOULD NATURALLY PROVIDE GROWING EVIDENCE OF NO IMPAIRMENT AS EXISTING BARRIERS DIMINISH IN IMPORTANCE. IS IT POSSIBLE THAT UNDERPRICED ACCESS TO UNE-P LEAVES NO INCENTIVE FOR CLECS TO PROVIDE SERVICE VIA UNE-L?

A. No, there are several reasons to believe this is not the case. The CLECs are new entrants into a market that has been monopolized for a century or more. They have much to gain by limiting their dependence upon the incumbent. Eliminating dependence on ILEC facilities will allow the CLECs to better differentiate their services and improve their appeal to customers, without having to cut prices to the bone. Moreover, if the

systems are in place to handle hot cuts and other interfaces between the CLEC and ILEC, the CLECs will have more control over the quality of service that they can offer their customers, and be able to offer redundancy to the ILECs' facilities. This factor has been a major factor in stimulating demand for the CLECs' transport services, and led to significant investment in facilities, even though leasing UNE transport was still available as an option.

III. MARKET DEFINITION

A. The Adopted Market Definition Should Permit Reasonable Conclusions from Both Trigger and Potential Deployment Analyses.

Q. WHAT MUST THE COMMISSION DETERMINE WITH REGARD TO MARKET DEFINITION?

A. As I have explained, both the "trigger" analysis and the analysis of potential deployment apply on a market-by-market basis, and the FCC has specified that states must use the same market definition in conducting both analyses.[32] Hence, the Commission must determine what market definition is most appropriate, given that the same definition must be applicable to both "trigger" and potential deployment analyses.

Q. PLEASE ELABORATE ON THE USE OF THE MARKET DEFINITION IN THE "TRIGGER" ANALYSES.

A. The separate markets defined by the Commission will first be used to identify market participants that may count toward satisfaction of self-provisioning and wholesale triggers. The *Triennial Review Order*'s trigger analysis is intended to provide "bright-line rules" that "can avoid the delays caused by protracted proceedings and can minimize

[32] *Id.* ¶ 495.

administrative burdens."[33] The correct functioning of these "bright-line rules" depends crucially on the markets the Commission defines for use in "market-by-market" analysis.

In particular, for the trigger analysis to correctly serve its function, markets must be defined so that "[i]f the triggers are satisfied, the states need not undertake any further inquiry, **because no impairment should exist in that market**."[34] That is, markets must be defined so that if the triggers are satisfied and the Commission reaches a finding of no impairment for a market, customers in the market have real choice, and competitive carriers are not impaired in their ability to reach the customers in the defined market, without access to unbundled local switching. Otherwise, the triggers could be satisfied when customers have no alternative choice of providers and indeed where competitors are impaired. The FCC made clear the importance of firms serving as actual alternatives when it explained that existing firms can only be counted toward satisfaction of a trigger if they are "currently offering and able to provide service, and likely to continue to do so.[35]

The triggers merely identify whether CLECs in a market are clearly not impaired without access to the local switching UNE. Failure to meet the triggers permits further analysis of potential deployment.

As a result, the role of market definition in the trigger analysis should be to identify the scope of telecommunications services and locations for which a market participant's switching capacity clearly shows the absence of impairment because

[33] *Id.* ¶ 498.

[34] *Id.* ¶ 494 (emphasis added).

[35] *Id.* ¶ 500.

customers already have real alternatives. Market definition should ensure that a qualifying market participant provides an acceptable alternative to qualifying service provided at a geographic location that actually serves the customers in the market. The new entrant's service must be an acceptable substitute, and the location at which service is offered must encompass the areas in which the customers require service. Successful entry into a different market, where the entrant's offering is not a close substitute for service provided with the incumbent's local switching or where the entrant is unable to provide service to the customers, offers no such evidence of non-impairment. Only if the qualifying participant has succeeded in overcoming operational and economic barriers to entry into a properly defined market, which recognizes buyers' product and location substitution possibilities, can the Commission be confident that the new entrant offers evidence of no impairment in provision of the specified service at the specified location.

Q. PLEASE ELABORATE ON THE USE OF THE MARKET DEFINITIONS IN THE "POTENTIAL DEPLOYMENT" ANALYSES.

A. If the triggers are not satisfied in a market, analysis proceeds to the possibility of potential deployment to test whether barriers to entry without unbundled access to a network element are "likely to make entry into a market uneconomic," or whether the market in question is "suitable for 'multiple, competitive supply.'"[36] Any such analysis must also be conducted on a market-by-market basis, analyzing the same markets that are used in the trigger analysis. At this stage of the analysis, the Commission must consider any local switching capacity of market participants identified in the trigger analysis in concert with analysis of operational and economic barriers to entry. As with the triggers,

[36] *Id.* ¶¶ 84, 506.

it is critical that markets not be defined too broadly; otherwise, the Commission would end up finding non-impairment in many areas in which competitors are in fact impaired, leaving customers with no choice among providers

Q. IS YOUR RECOMMENDED APPROACH TO MARKET DEFINITION EQUALLY APPLICABLE TO BOTH THE WHOLESALE AND SELF-PROVISIONING TRIGGERS?

A. Yes. As I explain in more detail below, the same approach to market definition applies to evidence of no impairment presented with respect to wholesale and self-provided switching.

Q. YOU INDICATED ABOVE THAT THE MARKET DEFINITION SHOULD PERMIT THE MOST UNAMBIGUOUS AND ACCURATE ANSWER TO THE QUESTION OF WHETHER CLECS ARE IMPAIRED WITHOUT ACCESS TO UNBUNDLED SWITCHING IN A PARTICULAR MARKET. PLEASE EXPLAIN IN MORE DETAIL WHAT YOU MEANT BY THAT STATEMENT.

A. The FCC has observed that "[i]t is fundamental to our general impairment analysis to consider whether alternative facilities deployment shows a lack of impairment in serving a particular market."[37] This means that the markets as defined should be sufficiently uniform that evidence of (actual or potential) facilities-based competition in any part of a given market implies the ability to provide service to all (or nearly all) customers in that market without access to unbundled switching.

Specifically, the T*riennial Review Order* calls for this Commission to conduct its investigation "on the most accurate level possible, while still preserving administrative practicality."[38] Accuracy is essential to carrying out the pro-competitive purposes of the

[37] *Id.* at n.1536.

[38] *Id.* ¶ 130.

Act. As I explained in more detail above, if markets are not defined correctly, the Commission could mistakenly find no impairment where, in fact, customers are left without competitive alternatives; or, a faulty market definition could lead the Commission to find impairment where none exists.

Q. HAS THE FCC ESTABLISHED ANY GUIDELINES OR PARAMETERS FOR THE MARKET DEFINITION TO BE USED IN TRIGGER AND POTENTIAL DEPLOYMENT ANALYSES?

A. Yes. The rules that the FCC adopted in its *Triennial Review Order* specify that:

> A state commission shall define the markets in which it will evaluate impairment by determining the relevant geographic area to include in each market. In defining markets, a state commission shall take into consideration the locations of mass market customers actually being served (if any) by competitors, the variation in factors affecting competitors' ability to serve each group of customers, and competitors' ability to target and serve specific markets profitably and efficiently using currently available technologies. A state commission shall not define the relevant geographic area as the entire state.[39]

The *Triennial Review Order* also presents examples of the factors that may vary geographically, such as "how the cost of serving customers varies according to the size of the wire center and the location of the wire center, and the variations in the capabilities of wire centers to provide adequate collocation space and handle large number of hot cuts."[40] Significantly, these criteria for market definition are not limited to variations in potential profitability that might be captured, at least in part, by grouping together wire centers that fall into the same UNE and/or retail rate bands. Instead, consistent with the operational basis for the FCC's national finding of impairment for mass-market

[39] 47 C.F.R. § 51.319(d)(2)(i).

[40] *Triennial Review Order* ¶ 496.

switching, the FCC suggests that the market consider variations in the ability of wire centers to handle large numbers of hot cuts.

I interpret this language to reference the hot cut process referred to by MCI's operational impairment witness, Mr. Stacy, as the *"Mass Market Hot Cut Process"* and not just the batch cut procedure that the FCC has directed state commissions to develop in the nine-month impairment proceedings (referred to by Mr. Stacy as the "*Transition Batch Hot Cut Process")*. Qwest's ongoing ability to perform hot cuts as mass-market customers change carriers (not only one or a handful of lines per location, but potentially hundreds of lines each day in a given wire center) is critical to the success of switch-based competition and must be considered at all phases of the impairment analysis, beginning with market definition.

Q. DOES ECONOMIC THEORY PROVIDE ANY GUIDANCE WITH RESPECT TO MARKET DEFINITION?

A. Yes. There is a body of economic analysis that applies to the question of defining markets. Much of the economic literature on market definition has focused on facilitating the assessment of market power in merger and antitrust proceedings. The FCC noted in its *Triennial Review Order* that the market power question is somewhat different from the impairment question before the Commission in this proceeding.[41] Nonetheless, the FCC also acknowledged that the market definition literature developed in the context of merger and antitrust analyses provides helpful guidance for market definition in the impairment context.[42] Hence, as I describe in more detail in a following section, I have

[41] *Id.* ¶¶ 74, 109.

[42] *Id.* at n.439.

taken this economic literature into account in developing my recommended market definition.

The essential economic criterion for whether a product belongs in a relevant market is whether the product can serve as an alternative to consumers in that market. Thus, for example, an apartment in Spokane is not in the same geographic market as an apartment in Seattle, because the Spokane apartment does not serve as a meaningful alternative for Seattle apartment hunters. A particularly clear and authoritative statement of this principle is the following:

> To define a market is to identify those producers providing customers of a defendant firm (or firms) with alternative sources for the defendant's product or service. A properly defined market excludes other potential suppliers (1) whose product is too different . . . or too far away . . . and who are not likely to shift promptly to offer defendant's customers a proximate alternative.[43]

I elaborate on this economic criterion in Sections III.B. and III.F. below.

Q. WHAT CONCLUSIONS HAVE YOU REACHED BASED ON YOUR APPLICATION OF THE GUIDANCE IN THE *TRIENNIAL REVIEW ORDER* AND ECONOMIC THEORY CONCERNING MARKET DEFINITION?

A. I have concluded that criteria of "accuracy" as well as "practicality" argue for the Commission to begin its analysis with the presumption that wire centers establish the appropriate level of granularity.

Wire centers are the most natural geographic boundaries for purposes of defining markets for several reasons. First, the costs of providing service vary widely from one wire center to another; it is not possible to draw conclusions about one wire center from an analysis of another wire center. Second, once a CLEC is serving some customers in a

wire center, it will face relatively lower cost of serving other customers in the same wire center, compared to the cost of entering a new wire-center market. Third, it is administratively feasible to administer the requirements of the *Triennial Review Order* on a wire-center basis, because data on CLEC activity, including collocation, and other cost information is available on this basis.

B. Market Definition Analysis Starts with a Specific Service or Product Offering in a Narrow Geographic Market and Then Expands the Relevant Market to Incorporate Substitutes.

Q. HOW DO ECONOMISTS TYPICALLY DEVELOP MARKET DEFINITIONS?

A. The process of defining a market invariably requires answering questions as to whether a particular product or location belongs in the market, or falls outside its boundaries. These questions are properly answered by starting with a single firm's product, offered at a specific location, and then expanding beyond this point to see whether customers regard products from the expanded product set or geographic area as adequate substitutes or alternatives for the original product.

Q. IS THIS APPROACH USED IN ANY OTHER REGULATORY CONTEXT?

A. Yes, the market definition approach I have just outlined is the same as the one used in the *Horizontal Merger Guidelines* ("HMG") of the U.S. Department of Justice ("DOJ") and the Federal Trade Commission ("FTC").[44] The HMG state that

> A market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-

[43] Areeda and Hovenkamp, 2nd Ed., Vol. IIA of Antitrust Law at 180, ¶530(a).

[44] The full text of the *Horizontal Merger Guidelines* of the U.S. Department of Justice and Federal Trade Commission, issued April 2, 1992, and revised April 8, 1997, (hereinafter, "HMG") is available online at http://www.usdoj.gov/atr/public/guidelines/horiz_book/10.html.

> maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a "small but significant and nontransitory" increase in price, assuming the terms of sale of all other products are held constant. *A relevant market is a group of products and a geographic area that is no bigger than necessary to satisfy this test.*[45]

The HMG approach "begin[s] with each product (narrowly defined) produced or sold by each merging firm" for the product dimension and "the location of each merging firm (or each plant of a multiplant firm)" for the geographic dimension.[46] This initial tentative market definition is expanded by asking whether consumers regard other products or locations as close enough substitutes that a price increase in the narrowly defined tentative market definition would be met by consumers switching to other products or locations.

The notion of "close enough" substitutes is given precision by asking whether a "small but significant and nontransitory" price increase in the narrowly defined tentative market definition would be met by a strong enough substitution response by consumers to make the price increase unprofitable, if it were implemented by a hypothetical monopoly provider controlling all of the products and locations in the tentative narrow market definition. The tentative market definition is too narrow if it fails to incorporate substitutes that consumers regard as "close enough," as measured by consumers switching to a substitute in response to a price increase. If a tentative market definition is found to be too narrow, the definition is expanded to incorporate the next best products or

[45] HMG, Section 1.0 (emphasis added).

[46] HMG, 1.11 *Product Market Definition General Standards*, and 1.21 *Geographic Market Definition General Standards*.

locations that consumers regard as "close enough" substitutes, but stops as soon as the market definition is sufficiently expansive to meet the price increase test I cited above.

In short, the analysis of market definition under the HMG is essentially the same as the one that I have outlined.

Q. YOU INDICATED ABOVE THAT THE CHOSEN MARKET DEFINITION MUST BE APPROPRIATE FOR BOTH TRIGGER AND POTENTIAL DEPLOYMENT ANALYSES. DOES THE HMG APPROACH TO MARKET DEFINITION WORK IN BOTH THESE CONTEXTS?

A. Yes. The concept of market participants in the HMG provides a straightforward basis for linking the geographic market definition to the trigger analysis. The *Horizontal Merger Guidelines* state that:

> Participants include firms currently producing or selling the market's products in the market's geographic area. In addition, participants may include other firms depending on their likely supply responses to a "small but significant and nontransitory" price increase. A firm is viewed as a participant if, in response to a "small but significant and nontransitory" price increase, it likely would enter rapidly into production or sale of a market product in the market's area, without incurring significant sunk costs of entry and exit. Firms likely to make any of these supply responses are considered to be "uncommitted" entrants because their supply response would create new production or sale in the relevant market and because that production or sale could be quickly terminated without significant loss.[47]

In the context of impairment analysis, firms counted toward the trigger analysis should be participants in the geographic market. A CLEC serving a group of customers in a specific geographic area would be counted as a participant in another geographic market only if it were currently offering service in that market or would promptly extend service to that market in response to a "small but significant and nontransitory" price increase.

This is one reason that it is important not to adopt too broad a geographic market definition. As the FCC has observed, "if competitors with their own switches are only serving certain geographic areas, the state commission should consider establishing those areas to constitute separate markets."[48] Using market definitions that correspond to the geographies over which competitors are actually serving customers will ensure that the trigger analysis works as intended, identifying cases in which multiple, competitive supply within a single geographic area is already a reality, not just a possibility. It would be wrong as a matter of economic principles, and contrary to the purpose of the trigger analysis, to lump together multiple geographic areas, each of which has fewer than three competitive suppliers, and treat those as a single geographic market in which the trigger is met.

Defining markets in this manner does not require a finding of impairment in every geographic market that currently lacks multiple, competitive supply. As the HMG indicate in a footnote to the passage concerning market participants quoted above:

> Probable supply responses that require the entrant to incur significant sunk costs of entry and exit are not part of market measurement, but are included in the analysis of the significance of entry. See Section 3. Entrants that must commit substantial sunk costs are regarded as "committed" entrants because those sunk costs make entry irreversible in the short term without foregoing that investment; thus the likelihood of their entry must be evaluated with regard to their long-term profitability.[49]

The potential deployment analysis described in the *Triennial Review Order* corresponds closely to this HMG approach of examining "committed entry" based on

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[47] *Id.* § 1.0 (footnote omitted).

[48] *Triennial Review Order* at n.1537.

[49] *Id.* at n.7.

long-term profitability analysis. Hence, it is entirely possible to use the market definition approach that I have described here in conjunction with a potential deployment analysis, as well as a trigger analysis.

C. The Geographic Market Definition Should Reflect the Customer Locations to which Competitors Now Provide Switching, Not the Physical Location or Potential Reach of Their Switches.

Q. HOW DOES THE FCC REQUIRE MARKETS TO BE DEFINED GEOGRAPHICALLY?

A. The FCC has noted that, "because we measure alternative 'switching' in a given market, not switches located in that market, the physical location of the switch is not necessarily relevant to defining the geographic market. For example, a switch located in Rhode Island could satisfy the switching trigger in Massachusetts if it is serving customers in the relevant market in Massachusetts."[50]

Because a triggering switch need not be located in the defined geographic market, it also follows that the geographic market need not correspond to the physical area that a switch can serve. The analysis should instead be focused on where CLECs actually provide *switching* in lieu of the unbundled switching that the ILEC provides throughout specific wire-center boundaries. In other words, the analysis should be focused on the actual customer locations that CLECs serve using their own switches.

[50] *Triennial Review Order* at n.1536.

D. The Geographic Market Should Allow the Most Accurate Analysis Possible, Consistent with Administrative Practicality.

Q. HOW DO YOU RECOMMEND THE COMMISSION DETERMINE THE RELEVANT GEOGRAPHIC MARKETS?

A. As I mentioned above, the *Triennial Review Order* requires that the Commission conduct its impairment analyses "on the most accurate level possible, while still preserving administrative practicality."[51] Market definition at the most accurate level of granularity, whether for application of the prescribed triggers or for analysis of potential deployment, would be conducted on a customer-by-customer basis.

This is precisely the approach that the FCC specifies in defining the geographic markets for application of trigger analysis to enterprise loops, for which impairment analyses must be conducted on a "customer-by-customer location basis."[52] It takes only a moment's reflection to recognize that mass-market consumers of qualifying telecommunications services will not accept any substitutes that do not deliver service to the customer's premises. Because qualifying services provided to a location other than to a customer's own premises will not be a satisfactory substitute, the "most accurate" level of granularity would address particular customer premises.

Although mass-market customers are tied to their locations just as tightly as enterprise customers, the FCC observes that considerations of practicality will not permit a customer-by-customer analysis, for at least some mass-market investigations.[53] Fortunately, subject to certain important limitations I discuss below, it is possible to

[51] *Id.* ¶ 130.

[52] *Id.* ¶ 307.

[53] *Id.* ¶ 309.

analyze customer-specific locations in large numbers, achieving administrative practicality with little or no loss of accuracy.

Q. WHAT AGGREGATIONS OF CUSTOMER LOCATIONS MAKE SENSE FOR AN IMPAIRMENT ANALYSIS OF MASS-MARKET SWITCHING?

A. Recognizing the limited role that can be fulfilled by non-incumbent mass-market loop facilities,[54] impairment analysis for mass-market switching must identify substitutes to the incumbent's local circuit switch "as a means of accessing the local loop."[55] Wire centers are the centers of outward-radiating ILEC loop facilities, and determine the point at which access to the incumbent's loops must occur. Because impairment regarding the local switching UNE is so closely related to access to the incumbent's loops, the wire center provides a natural unit of analysis. *Insofar as an entrant in a particular wire center is not impaired in its ability to expand service to all customers served by loops in that wire center*, it is reasonable to aggregate customers and consider impairment issues at the wire-center level.[56] There are, however, exceptions to this rule based on operational and technical impairment issues, as I explain below.

Q. WHAT LIMITATIONS MUST BE IMPOSED ON THE AGGREGATION OF CUSTOMER LOCATIONS TO THE WIRE-CENTER LEVEL?

A. The crucial limitation is that a UNE-L CLEC's entry in a wire center must afford that CLEC the opportunity to expand to serve any customer in that wire center. The

[54] *Id.* ¶ 439.

[55] *Id.* ¶ 429.

[56] As Qwest noted in its *Petition* (p. 12, l. 17, 18), "the basic geographic unit for collecting data will likely be at the wire center level, but a geographic market would, at the very least, comprise several wire centers in an MSA or LATA or could be the entire service territory of Qwest in a state." As I explain below, the wire center is a reasonable starting point for the Commission's market definition, and expanding beyond the wire center is never called for because it would introduce inaccuracy without any gain in practicality.

failure of this condition implies that aggregation of customers to the wire-center level will introduce misleading evidence and lead the Commission to mistaken conclusions about impairment. The nature of this requirement is explained in the following quotation from a popular antitrust law text:

> Competitors, supply substitution, and entry: (a) Expansion by immediate competitors.] The demand for Alpha Company's product is obviously affected by the ability of its direct competitors to deliver the same product. But if the others are to limit Alpha's actions, they must be able to expand their production when Alpha increases its prices because consumers cannot turn to other suppliers if those suppliers are unable to expand their output.[57]

I will discuss below several specific conditions that can limit the ability of a CLEC in a particular wire center to serve certain customers in that wire center. I simply note here that aggregating customers to the level of the wire center presumes the absence of one overarching limitation on the CLEC's ability to expand. That overarching limitation is the possibility that there are operational barriers to the CLEC's expansion. For instance, if a CLEC that has entered a particular wire center cannot adequately expand its operations in that wire center, due to the presence of operational barriers such as the hot-cut limitation that is the basis for the national finding of impairment, then it is not reasonable to aggregate customers and consider the question of impairment at the wire-center level.

Q. ARE THERE OTHER FACTORS THAT SUPPORT A MARKET DEFINITION AT THE WIRE-CENTER LEVEL?

A. Yes. The *Triennial Review Order* specifically requires state commissions "to define each geographic market on a granular level and direct[s] them to take into

consideration the locations of customers actually being served by competitors, the variation in factors affecting competitors' ability to serve each group of customers and competitors' ability to target and serve specific markets economically and efficiently using currently available technologies."[58] Many of these factors vary at the wire-center level.

In most cases, CLEC self-provisioning of local switching will require collocation at each wire center the CLEC intends to serve. In those cases in which all competitive facilities deployed are available to serve any loop in the wire centers in which they offer service, *i.e.*, where there are no operational barriers to such expansion throughout the wire center, trigger analysis can proceed with the wire center as the geographic market definition with little or no loss of accuracy.[59]

The wire center also provides a natural unit of analysis for the investigation of potential deployment. First, because a portion of the costs of establishing service in a previously unserved wire center will be sunk costs, CLEC entry decisions will have to be justified at the wire-center level. This justification will require the CLEC to compare the stream of net operating income projected for a wire center to the investment cost that must be incurred to establish the collocation or other arrangements needed to offer service in the wire center. Further, various costs and revenues that must be considered in analysis of potential net operating revenue vary, sometimes dramatically, between wire

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[57] Phillip Areeda and Louis Kaplow, *Antitrust Analysis: Problems, Text, and Cases*, Fifth Edition, 1997, Aspen Publishers, p. 570, ¶ 342.

[58] *Triennial Review Order* at n.1536.

centers. As examples, potential revenue from serving a wire center will vary with the number of lines in the wire center and the profile of the typical customer at the wire center; also, the cost of backhauling traffic from the wire center will vary with the number of lines in the wire center, and the wire center's proximity to other elements of the CLEC's network.

Q. IS IT PRACTICAL FOR THE COMMISSION TO CONDUCT THE IMPAIRMENT ANALYSIS AT THE WIRE-CENTER LEVEL?

A. Yes; analysis at the wire center level is actually the most straightforward approach, both for trigger analysis and for analysis of potential deployment. Indeed, as I noted before, Qwest's *Petition* indicates that the wire center will likely be the basic geographic unit at which data is collected.[60] For the analysis of triggers, the logical data to rely on initially—facilities in place in the incumbent's wire centers, capabilities of competitors' facilities, capacity available for expansion—are data that are available and most accurately interpreted at the wire center level. ILEC tariff data needed for the impairment analysis—UNE loop rates and retail rates—are also readily available on a wire-center basis. Also, information on customer demographics can be obtained on a wire-center basis, either from the data collected for TELRIC cost models, universal service models or from public sources.

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[59] As I discuss further below, there is an important caveat to this discussion. It is crucial to distinguish between business and residential customers because of the prevalence of price discrimination, as well as other differences, between the two groups.

[60] *Petition*, at p. 12, l. 17, 18.

Q. IS IT IMPORTANT TO CONDUCT AN IMPAIRMENT ANALYSIS AT A LEVEL AS GRANULAR AS THE WIRE CENTER?

A. Yes. Examination of pertinent data at a higher level of aggregation will be less helpful at best, and very possibly misleading.

For example, it would be an error to conclude that entry is feasible in two wire centers because the combined present value of potential revenues net of operating costs in the two wire centers exceeds the combined investment costs of entering the two wire centers. The two wire centers may be like a bucket of ice water and a bucket of boiling water, which, on average, are a comfortable temperature. The fact that entry is feasible in one wire center but not the other will not be revealed from examination of average or total costs for the two wire centers. If the Commission finds no impairment in both wire centers, the result will be that end users in at least one of the wire centers will lose the competitive alternatives that would be available to them if CLECs were to retain unbundled access to the incumbent's local circuit switch.

If the Commission were to conduct its trigger analyses under a market definition that lumps together more than one wire center, it would need criteria to determine whether competitive facilities satisfy the requirement of the trigger or not. Whatever criterion is adopted, the analysis would be likely to result in error. The trigger analysis treats each qualifying competitive carrier as evidence that barriers to entry have been overcome and no impairment exists. In fact, in a collection of two wire centers, a competitive switch-based provider that is offering service to customers in one wire center does not provide any evidence whatsoever of the absence of impairment in the other wire center. As suggested above, analysis of potential deployment in the wire center that has

not experienced actual deployment may show that competitive entry without access to the local switching UNE is extremely unlikely because of the cost and revenue characteristics of the wire center. A finding of no impairment in such a wire center, based on actual deployment in another wire center, would result in customers in that wire center losing competitive alternatives that rely on the availability of the local switching UNE, with no prospect of switch-based competitors actually overcoming operational and economic barriers to entry.

A market definition that ignored these factors would fly in the face of the entire foundation of antitrust and regulatory economics. It is nonsensical to ignore the costs and entry barriers faced by CLECs wishing to expand service to new locations and define away these important cost differences by simply declaring a large group of customers to be in the same geographic market.

Q. SOME WOULD ARGUE THAT MANY OF THE CLEC'S COSTS, SUCH AS OPERATIONS SUPPORT SYSTEMS, SWITCHES, AND SOME MARKETING COSTS, ARE INCURRED AND ARE USEFUL OVER RELATIVELY LARGE MARKET AREAS. DOES THE EXISTENCE OF THESE COSTS COMPEL A MORE EXPANSIVE MARKET DEFINITION THAN THE INDIVIDUAL WIRE CENTER?

A. No. These types of cost create economies of scale. For some products, as distinguished from services, economies of scale can lead to large geographic markets.[61]

[61] It is the relatively low cost of transporting some products that allows a manufacturer to achieve the scale of operation that yields great economies. In the case of a product with relatively low transportation costs, *acceptable alternative products become available to consumers* even though the products may need to be shipped great distances. Telecommunications services are services, not products, and the cost of transporting telecommunications services from one possible delivery point to another is the cost of extending delivery of service to the customer's premises. This cost is not a trivial matter, comprising the cost of collocation, multiplexing and concentration equipment, and backhaul to the CLEC's switch, and is the explicit subject matter of analysis of potential deployment.

The presence of economies of scale in the provision of telecommunications services leads providers to ***enter many separate markets***; it does not suggest a more expansive geographic definition of markets. Whether for products or services, markets are always defined by reference to acceptable alternatives that are available to customers, as discussed above.

Q. DO LARGE FIXED COSTS OR ECONOMIES OF SCALE LEAD TELECOMMUNICATIONS PROVIDERS TO A LARGER SCALE OF OPERATION?

A. Certainly; telecommunications providers take advantage of scale economies by ***entering additional separate markets***. There is no question that it is in the interest of the CLEC to spread the cost of large fixed investments over as broad a customer base as possible, and to achieve volumes sufficient to take advantage of economies of scale wherever such economies are possible. In the local telecommunications business, this means operating in multiple markets, and does not suggest redefining markets on the basis of considerations other than the set of alternatives available to customers. The decision to deploy facilities to enter additional markets by providing connectivity to the CLEC's network is still conducted on a very granular basis. As the manager of a CLEC, I may want to operate in as many markets as possible and add as many customers as possible to lower the average cost of my fixed investments that can apply to many wire centers, but I gain nothing, and lose much, if the customers in a particular wire center produce negative net revenue. In deciding whether to obtain or construct collocation facilities in an individual wire center, the CLEC manager must consider the number of customers that reasonably can be expected to subscribe to the CLEC's services, the amount of revenue that will be produced by those customers, and must compare the

anticipated revenue to the investments and operating expenses associated with adding those collocation facilities to the CLEC's network. If the wire center cannot contribute to the bottom line, it simply will not make sense for the CLEC to offer services to customers in the wire center. I discuss these issues further in Section V.B below,[62] in which I outline the costs and revenues that a CLEC would take into account in deciding whether to offer UNE-L based service in a particular area.

The claim that a market definition comprised of multiple wire centers is required to take account of economies of scale in switching, or economies in other aspects of CLEC market entry, simply makes no sense; costs of providing service only affect market definition insofar as they affect the acceptable alternatives available to consumers. Under this flawed rationale of basing market definition on the nature of costs rather than alternatives available to consumers, the existence of widely acknowledged economies of scale in advertising would argue for a national market definition, in clear violation of the FCC's injunction that markets cannot be defined to be as large as a state.[63] Economies of scale arising from the fixed costs of developing OSS interfaces would suggest the RBOC region as a market definition. Basing market definition on the area that can be served by a switch again clearly raises a conflict with the requirement to define markets as smaller than states; recall the FCC's example of a switch in Rhode Island serving customers in Massachusetts.[64] Beyond the obvious conflict with the requirements of the *Triennial*

[62] The discussion in Section V.B below describes costs and revenues that must be considered in the economic portion of a potential deployment analysis.

[63] *Triennial Review Order* ¶ 495

[64] *Id*. at n.1536

Review Order, it simply doesn't make sense to define markets on the basis of criteria other than the availability to consumers of acceptable substitutes.

For the analysis of potential deployment, it is a simple matter to give effect to the FCC's concern about the role of economies of scale in market definition.[65] For the analysis of potential deployment, it is reasonable to use costs for functions such as switching, that may benefit from economies extending beyond the wire center, based on the assumption that the switch (or other function) is operating at volumes that take full advantage of economies of scale. That is, one can assume that each wire center is economically includable in an aggregation of wire centers that takes advantage of economies of scale. This approach is practical and doesn't make the gross sacrifice of accuracy involved in aggregating multiple wire centers into a single market.[66]

E. The Commission Must Also Determine the Mass-Market Boundary.

Q. YOU INDICATED ABOVE THAT THE COMMISSION MUST DETERMINE THE CUTOVER BETWEEN MASS-MARKET CUSTOMERS AND ENTERPRISE CUSTOMERS IN THIS PROCEEDING. HOW DOES THE FCC DISCUSS THE MASS-MARKET CUTOFF ISSUE IN THE *TRIENNIAL REVIEW ORDER*?

A. In paragraph 497 of the *Triennial Review Order*, the FCC notes that mass-market customers "are analog voice customers that purchase only a limited number of POTS lines, and can only be economically served via DS0 loops." The FCC notes that POTS lines (DS0 loops) are used by both residential and very small business customers. It then goes on to discuss the issue of the mass-market cutoff as a means of differentiating

[65] *Id*. ¶ 495

[66] Any model, such as the NRRI model for example, that assumes a constant cost per unit of switching, implicitly assumes that the switch operates at sufficient volume to attain that level of cost per unit. The defining character of economies of scale is that unit cost is lower at higher volumes.

enterprise customers from mass-market customers and directs the states to determine the mass-market cutoff point:

> Therefore, as part of the economic and operational analysis discussed below, a state must determine the appropriate cut-off for multi-line DS0 customers as part of its more granular review.[67]

Q. WHAT FACTORS SHOULD THE COMMISSION CONSIDER IN DETERMINING THE APPROPRIATE CUTOFF?

A. The appropriate cutoff is based on many factors, including not only the relative pricing of voice-grade and DS-1 loops, but also the cost of customer premises equipment ("CPE") needed to enable end-users to place phone calls over digital loop facilities such as a DS-1 loop. Circumstances unique to specific customers may lead to different conclusions than would emerge from the simplest cost minimization calculation. For example, a firm expecting substantial growth in its need for telecommunications services might prefer an easily expandable system using a DS-1, even though the firm's present demand could be satisfied at lower cost with several analog voice grade loops. Another growing firm, expecting to relocate to larger facilities, might delay changing CPE to coincide with its relocation, even though it has outgrown its current facilities based on voice grade loops, and its current demand for telecommunications services could be met at lower cost using a DS-1 and appropriate CPE. Small businesses in different industries may reach very different decisions regarding the choice of CPE served by DS0s or a DS1; that is, customers in some industries may receive great benefits in the form of control and flexibility associated with the more sophisticated CPE used under a DS-1 arrangement, and may not be concerned about the care and programming of that

[67] *Triennial Review Order* ¶ 497.

equipment. In other industries needing only basic voice services, the setup and maintenance of more sophisticated CPE may be a substantial disadvantage of a move to a DS-1 arrangement. Thus, beyond any simple calculation comparing the costs of equipment and services under DS-0 or DS-1 arrangements, it is important to look at the empirical evidence of marketplace behavior to determine whether there are other factors that are affecting a customer's decision to go DS-1 versus multiple voice-grade loops. In the end, the boundary between the mass-market and the enterprise market in a particular location is complicated by many factors. It is a difficult and somewhat arbitrary task to draw a boundary between mass-market and enterprise customers by reference to the *single criterion* of the number of DS-0 loops the customer would require if not served with a DS-1.

At this time, I do not have all the necessary information to recommend a specific mass-market cutoff. I plan, however, to review the data provided in the initial testimonies of Qwest and other parties as well as any pertinent data request responses and will comment on other parties' proposals in my reply testimony.

F. The Commission Must Define Product Market(s) as well as Geographic Markets.

Q. ARE THERE ANY OTHER ASPECTS TO THE MARKET DEFINITION THAT THE COMMISSION MUST DETERMINE IN THIS PROCEEDING?

A. Yes. The Commission must also determine the relevant product market(s), so that it can evaluate whether potential triggering companies are offering a product that substitutes for Qwest's retail local exchange services and/or the retail local exchange services that a CLEC can offer to mass-market customers via UNE-P.

Q. HOW SHOULD THE COMMISSION IDENTIFY THE PRODUCT OR PRODUCTS INCLUDED IN THE RELEVANT MARKET?

A. The Commission should identify the product or products included in the market based on the *Triennial Review Order*'s discussion of qualifying services: in short, "those services that have been traditionally the exclusive or primary domain of the incumbent LECs."[68] Within the product market, the Commission should include any alternative to the ILEC's local voice service, including vertical features and access service, that is comparable in "cost, quality and maturity" to the ILEC's own retail local exchange services.[69] This product definition includes traditional circuit-switched local exchange services provided by competitors that self-deploy switches (or use third-party switches) in conjunction with the incumbent's voice-grade UNE loops (what is sometimes described as a "UNE-L" entry strategy) and may include packet-switched local service or "intermodal" alternatives when such services meet the "cost, quality and maturity" requirements of the *Triennial Review Order*. I provide further discussion of intermodal alternatives in Section IV.B.3 below, which describes the criteria necessary to determine whether a competitor should be considered as a potential triggering company.

Q. ARE THERE OTHER POTENTIALLY RELEVANT DISTINCTIONS RELATED TO THE PRODUCT MARKET OR MARKETS?

A. Yes. As one example, it may be necessary to subdivide the ILECs' customers into two different markets, residential and business, even though most of the same products are sold to these two classes of customers. The reason is that price discrimination can be enforced between the two market segments.

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[68] *Id.* ¶ 135.

[69] *Id.* ¶ 97.

Q. PLEASE EXPLAIN THE ROLE THAT PRICE DISCRIMINATION PLAYS IN DEFINING MARKETS.

A. Basic economic principles require a departure from the ordinary process of market definition in the presence of price discrimination—"charging different prices for the same product, for example."[70] If the characteristics of the product and its buyers permit profitable price discrimination, then market definition must recognize "particular use or uses by groups of buyers" and "particular locations of buyers" that would be targeted for higher prices.[71]

This situation arises whenever the hypothetical monopolist in a tentatively defined market "can identify and price differently to those buyers ('targeted buyers') who would not defeat the targeted price increase by substituting to other products." When this situation arises, the tentative market has been defined too broadly, and must be divided to recognize "targeted buyers," whether identified by location, by the nature of their use of the product, or by membership in an identifiable group of buyers.[72]

Q. HOW DOES THE POSSIBILITY OF PRICE DISCRIMINATION AFFFECT THE MARKET DEFINITION YOU HAVE JUST DESCRIBED?

A. As I discussed above, market definition in the presence of price discrimination must treat as separate markets those groups of "targeted buyers" who cannot effectively

[70] HMG 1.12, *Product Market Definition in the Presence of Price Discrimination*.

[71] HMG 1.12, *Product Market Definition in the Presence of Price Discrimination,* and HMG 1.22, *Geographic Market Definition in the Presence of Price Discrimination.*

[72] The use of the term "targeted buyers" in the HMG is the opposite of the way in which the FCC uses the term "targeted customers." In the HMG, the targeted buyers are the ones who lack competitive options, whereas in the FCC's parlance, the targeted customers are the ones singled out for competitive supply. The fundamental logic of the HMG's discussion of price discrimination, however, aligns precisely with the FCC's identified concern about targeted customers.

avoid a "targeted price increase by substituting to other products."[73] The price difference between small business customers and residential customers receiving essentially identical service is a classic example of price discrimination.

The FCC specifically directs state commissions to recognize, for market definition purposes, that "competitors often are able to target particular sets of customers."[74] CLECs provisioning their own switches can, and do, target business customers, even to the exclusion of residential customers.

This targeting of switch-based service to business, rather than residential, customers occurs in part because the characteristics of business customers, even very small ones, are different from those of residential customers, suggesting differences in CLECs' abilities to serve these different groups of customers—a factor this Commission must consider in defining markets. Further, because of the longstanding ILEC practice of targeting business customers for higher rates than residential customers, CLECs can also target this group and price differently to residential and small business customers.

Q. ARE YOU PROPOSING TO CHANGE THE FCC'S DEFINITION OF MASS-MARKET CUSTOMERS?

A. No. With respect to unbundled switching, the FCC has drawn a distinction between customers that it is economically feasible for a CLEC to serve via a DS-1 arrangement (and therefore are unaffected by the hot-cut barrier to entry that is the basis for the national finding of impairment) and customers that can only be served economically via voice-grade loops (which the *Triennial Review Order* describes as DS-

[73] HMG 1.12 *Product Market Definition in the Presence of Price Discrimination.*

[74] *Triennial Review Order* at n.1539, interpreting accompanying text at ¶ 495.

0s).[75] All of the latter customers logically fall into a broad category of mass-market customers that are affected by the national, hot-cut-based finding of impairment; hence, the Commission should consider in this proceeding whether CLECs are impaired without access to unbundled switching to serve any and all of these customers.

My point, however, is somewhat different. There are numerous other potential sources of impairment besides the hot-cut problem, many of which relate to economic issues. The economics of providing UNE-L based service to residential and small business customers may be quite different, and the empirical evidence of many CLECs offering service only to business customers suggests that the difference is important. The distinction between business and residence is important both for potential deployment analysis, which must account for the revenue difference between business and residential customers, and for trigger analysis, which seeks to identify CLECs that provide evidence of overcoming barriers to entry relevant to both business and residential customers. The Commission should avoid any risk of basing a finding of no impairment on evidence that applies only to, *e.g.*, small business customers. The Commission, therefore, must be prepared either to treat residential and small business customers as falling into two separate submarkets of the mass market or, in the alternative, to require that a competitor must serve both residential and small business customers to be considered as a potential triggering company. I discuss these possibilities further in Section IV.B.4 below.

[75] I discuss the boundary between mass-market and enterprise customers in Section III.E below.

Q. IS THERE ANY OTHER INSTANCE IN WHICH THE COMMISSION MAY NEED TO MAKE FURTHER DISTINCTIONS AMONG MASS-MARKET CUSTOMERS OR CUSTOMER LOCATIONS?

A. Yes. When the ILEC is unable to unbundle loops that are served over IDLC CLECs using their own switches cannot gain access to such loops to serve mass-market customers. In the circumstance that a loop served over IDLC is not available to CLECs, the end user served by that loop will not have competitive choices. CLECs can, however, serve mass-market customers over IDLC when Qwest makes UNE-P available. As the Commission is well aware, IDLC plays a large role in Qwest's plans for its network. Hence, over time, the portion of the market that CLECs using their own switches cannot reach will grow.

Q. IS THERE ANY ADDITIONAL COMPETITIVE SIGNIFICANCE TO THE ILECS' IDLC LOOP PLANT?

A. Yes. The *Triennial Review Order* determined that the ILEC is not required to unbundle its network to enable a competitive carrier to offer Digital Subscriber Line ("DSL") service on ILEC loops that are provisioned with Digital Loop Carrier ("DLC") equipment. This will place the CLEC at a competitive disadvantage relative to the ILECs, which in many cases have deployed DLC equipment capable of providing their own retail customers with DSL service.

Q. HOW SHOULD THE COMMISSION TAKE THESE POTENTIAL PRODUCT MARKET DISTINCTIONS INTO ACCOUNT?

A. The Commission should consider each of these potential product market distinctions in its "trigger" or actual deployment analyses. I elaborate on the approach that I recommend in the sections that follow.

IV. ANALYSIS OF TRIGGERS ON A MARKET-BY-MARKET BASIS

A. Introduction – Retail and Wholesale Triggers

Q. ONCE THE COMMISSION HAS ESTABLISHED A MARKET DEFINITION, WHAT IS THE NEXT STEP IN THE ANALYSIS REQUIRED BY THE FCC?

A. The next step in the analysis is the review of evidence concerning so-called "triggers." There are both retail and wholesale triggers.

Q. WHAT IS THE STATED PURPOSE OF THE TRIGGER ANALYSIS PRESCRIBED BY THE FCC?

A. The triggers are to be "a principal mechanism for use by states in evaluating whether requesting carriers are in fact not impaired in a particular market."[76] The FCC found that "presence of facilities-based competitors is the best indicator that requesting carriers are not impaired."[77]

However, it is important to remember that the FCC's national finding of impairment with respect to mass-market switching is based upon impairments related to the ILECs' hot cut processes. Therefore, the most reasonable interpretation of the trigger test is that the triggers are intended to deal with the unambiguous cases in which the bright line is easy to see. In cases in which the trigger is satisfied, it should be virtually certain that the national finding of impairment does not apply. In such cases, barriers have clearly been overcome by competitors deploying their own switching facilities (or using third-party switching) in a manner that ensures that all, or virtually all, of the

[76] *Id.* ¶ 498.

[77] *Id.*

customers in the market have meaningful alternatives to the incumbent's local exchange services.[78]

Q. WHAT IS THE RETAIL TRIGGER?

A. The self-provisioning, or "retail" trigger relates to the number of competitors that have demonstrated the possibility of overcoming barriers to entry by self-deploying switching to provide retail local exchange services to mass-market customers located in each geographic market. The FCC requires that there be at least three such competitors in a given geographic market to satisfy the retail trigger and thereby justify a finding of no impairment in the geographic market.[79]

Q. WHAT IS THE WHOLESALE TRIGGER?

A. The competitive wholesale facilities, or "wholesale" trigger relates to the presence of competitors that own their own switches and are offering wholesale switching services that would enable other competitors to provide retail local exchange services to mass-market customers located in each geographic market. The FCC requires that there be at least two such competitors in a given geographic market to satisfy the wholesale trigger and thereby justify a finding of no impairment in the geographic market.[80]

The FCC observed that no party to its *Triennial Review* proceeding had provided evidence of any third-party (wholesale) offerings of local circuit switching that could substitute for the ILEC's unbundled switching.[81] Further, Qwest's *Petition* states that

[78] I elaborate on this concept below in my discussion of the FCC's guidelines with respect to the scale and scope of competitive alternatives.

[79] *Triennial Review Order* ¶ 501.

[80] *Id.* ¶ 504.

[81] *Id.* ¶ 442.

Qwest is unaware of such wholesale switching capacity in Washington.[82] Hence, it is unlikely that the wholesale trigger will be relevant in this proceeding. In the discussion that follows, I will focus on the retail trigger, although I will note for completeness certain requirements that are pertinent to the wholesale trigger as well.

Q. HOW CAN THE COMMISSION DETERMINE WHETHER THE TRIGGERS HAVE BEEN MET IN A PARTICULAR MARKET?

A. The Commission can apply the rules found in the *Triennial Review Order* in a manner that comports with the pro-competitive goals of the Act and sound economic principles. In the discussion that follows, I describe the rules presented in the *Triennial Review Order* and explain how the Commission can apply them in a meaningful way. To aid the Commission in reviewing evidence that purports to show that either the retail or wholesale trigger has been met in a particular market, I have also prepared a flowchart that summarizes the requisite analysis. This flowchart is attached as Exhibit RC-3 to my testimony.

B. FCC Rules for Identifying Relevant Competitors

Q. WHAT GUIDELINES HAS THE FCC PROVIDED CONCERNING THE COMPETITORS THAT CAN BE COUNTED TOWARD EITHER THE RETAIL OR WHOLESALE TRIGGER?

A. In addition to the basic requirement that potential triggering companies must be "using or offering their own separate switches,"[83] the FCC has identified rules with respect to the following:

(1) Corporate ownership;

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[82] *Petition* at p. 16, l. 4

[83] *Triennial Review Order* ¶ 499. This requirement appears as the first item on the flowchart in Exhibit RC-3.

(2) Active and continuing market participation;

(3) Intermodal competition; and

(4) Scale and scope of market participation.

I discuss each of these rules, and other pertinent considerations, below.

1. Corporate Ownership

Q. WHAT ARE THE FCC'S RULES WITH RESPECT TO CORPORATE OWNERSHIP?

A. The FCC has imposed two separate restrictions on corporate ownership. First, a carrier can only count toward the retail or wholesale trigger in a particular market if that carrier is unaffiliated with the incumbent.[84] Second, to prevent "gaming," carriers affiliated with one another, but not the incumbent, only count as a single carrier toward satisfying the pertinent trigger.[85] These two requirements appear as the second and third items on the flowchart in Exhibit RC-3.

2. Active and Continuing Market Participation

Q. WHAT ARE THE FCC'S RULES WITH RESPECT TO A POTENTIAL TRIGGERING CARRIER'S ACTIVE AND CONTINUING MARKET PARTICIPATION?

A. The FCC stresses that potential triggering carriers must be "actively providing voice service to mass market customers in the market."[86] Moreover, the state commission must verify that the competitors in question have not, for example, filed a

[84] *Id.* ¶ 499.

[85] *Id*. In both instances, the FCC relied on a definition of affiliation found in Section 3 of the Act (47 U.S.C. § 153(1)). *Id.* at n.1550.

[86] *Id.* ¶ 499.

notice to terminate service in that market[87] or provided other evidence demonstrating that they no longer intend to be an active participant in that market. These requirements are reflected in the fourth item in the flowchart in Exhibit RC-3.

The clear intent of these rules is to ensure that any company counted toward a trigger is an active and continuing participant in the relevant market. To give these rules economic meaning, the Commission should require evidence that any company counted toward a trigger is actively soliciting new customers and has, in fact, added new customers *in that market* within the recent past (*e.g.*, the most recent month for which data are available).

3. Intermodal Competition

Q. WHAT ARE THE FCC'S RULES WITH RESPECT TO INTERMODAL COMPETITION?

A. The FCC requires states to consider whether intermodal alternatives are comparable in "cost, quality and maturity" to the incumbent's switched mass-market voice services before counting such alternatives toward the trigger in any market.[88] Based on these criteria, the FCC specifically indicated that it did not expect states to count commercial mobile radio service ("CMRS") carriers toward either trigger.[89] Similarly, the FCC indicated that fixed wireless has "not proven to be viable or deployable on a mass market scale," implying that fixed wireless services do not meet the

[87] *Id.* at n.1556.

[88] *Id.* at n.1549. *See also* ¶ 97.

[89] *Id.*at n.1549. The FCC defines CMRS carriers as "any mobile service, as defined in section 3 of the Act, as amended, provided for profit and making interconnection services available to the public." *Id.*at n.164, citing 47 U.S.C. § 332(d)(1). This definition includes, but is not limited to, traditional cellular carriers.

"comparable in cost, quality and maturity" standard for inclusion in the trigger analysis.[90] The FCC did, however, leave open the option of counting carriers that use packet switches or soft switches to provide voice services to mass market customers.[91]

To give economic meaning to these rules, I recommend that the Commission place the burden of proof on Qwest to demonstrate that any intermodal alternative it proposes to count toward the triggers satisfies the "comparable in cost, quality and maturity" standard identified in footnote 1549 to the *Triennial Review Order*. I have therefore included as the fifth item in the Exhibit RC-3 flowchart an evaluation of the incumbent's showing as to the cost, quality and maturity of any intermodal providers proffered as potential triggering companies.

Q. SHOULD CABLE TELEPHONY PROVIDERS BE CONSIDERED POTENTIAL MASS MARKET TRIGGERING COMPANIES?

A. No. As the FCC acknowledged, cable telephony fails to serve the "crucial function" of affording access to the incumbent's loops,[92] and therefore "provides no evidence that competitors have successfully self-deployed switches as a means to access the incumbents' local loops, and have overcome the difficulties inherent in the hot cut process."[93] Cable telephony's strategy is to "bypass the incumbent LECs' networks entirely."[94] This strategy is only available to a single firm in any market because cable TV companies, due to "unique economic circumstances of first-mover advantages and

[90] *Id.* ¶ 310.

[91] *Id.* at n. 1549.

[92] *Id.* ¶ 439.

[93] *Id.* ¶ 440.

[94] *Id.*

scope economies, have access to customers that other competitive carriers lack."[95] As a result, neither cable telephony nor CMRS "can be used as a means of accessing the incumbents' wireline voice-grade local loops. . . . Accordingly, neither technology provides probative evidence of an entrant's ability to access the incumbent LEC's wireline voice-grade local loop and thereby self-deploy local circuit switches."[96]

Beyond these considerations, any competitive facilities that allow access to some customer locations but not others clearly cannot be regarded as probative evidence of no impairment concerning those customer locations that cannot be reached by the competitive facilities. Cable telephony is at most an alternative to the ILEC's local voice service for the specific customer locations served via the cable company's facilities, which typically do not reach all of the ILEC's mass-market customer locations. (For example, cable facilities frequently do not serve the central business districts in which many mass-market small business customers may be located.[97])

For similar reasons, the FCC determined that the availability of cable telephony does not eliminate impairment with respect to the ILEC's voice-grade loop facilities.[98] Because cable telephony offers an alternative to the ILEC's mass-market switching facilities only where it also offers an alternative to the ILEC's loop facilities, it logically follows that cable telephony does not cure impairment with respect to mass-market switching, either.

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[95] *Id.* ¶ 310.

[96] *Id.* ¶ 446.

[97] *Id.* at n. 1349.

[98] *Id.* ¶¶ 228, 229 and 245.

In addition, cable telephony does not unambiguously fulfill the "cost, quality and maturity" criteria established by the FCC. Cable telephony services (particularly the recent variants provided using Voice over Internet Protocol, or VoIP, technology) are relatively new; it is not yet clear whether most consumers perceive such services to be comparable to local telephone service, especially with respect to reliability issues such as E-911 and backup power in emergencies.[99] Thus, I believe that a reasoned analysis disqualifies cable telephony from being considered as a "close enough" substitute for the ILEC's local voice services to be included in the product market for the mass-market switching impairment analysis.

4. Scale and Scope of Market Participation

Q. WHAT ARE THE FCC'S RULES WITH RESPECT TO THE SCALE AND SCOPE OF MARKET PARTICIPATION?

A. The FCC identified specific rules with respect to scale and scope of market participation for wholesale providers and more general guidance with respect to the scale and scope of such participation for retail competitors that self-deploy switching.

For a competitor to be counted toward the wholesale trigger in a given market, the carrier must "be operationally ready and willing to provide wholesale service to all competitive providers in the designated market."[100] The wholesale carrier need not, however, provide "the full panoply of services offered by incumbent LECs."[101]

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[99] *See, e.g.,* Alan Breznick, "Backup Power Reemerges as Issue for Cable VoIP Service," *Cable Datacom News*, October 2003, a copy of which is attached hereto as Exhibit RC-4.

[100] *Triennial Review Order* ¶ 499 (as amended by the FCC's *Errata* released on September 17, 2003).

[101] *Id.*

For retail providers, the FCC provides state commissions with the far more general guidance that, "in circumstances where switch providers (or the resellers that rely on them) are identified as currently serving, or capable of serving, only part of the market, the state commission may choose to consider defining that portion of the market as a separate market for purposes of its analysis."[102] In the context of this Commission's investigation, the FCC's general guidance provides for instances in which the Commission may choose to conduct its trigger analysis on a more granular basis than the wire center or, in the alternative, provides guidance as to whether a particular competitor should count toward the trigger in a given wire-center market as defined by the Commission.

The Commission can achieve the same effect either by narrowing the market definition in such a way that the potential triggering companies do in fact offer services to all, or virtually all, customers within the defined market, or by declining to count companies that do not offer services to all, or virtually all, mass-market customers within the geographic market that the Commission adopts. Either approach accomplishes the essential economic purpose of applying triggers in a manner that ensures that all, or virtually all, customers within a given market have significant alternatives.

Q. WHY DO YOU SAY THAT TRIGGERS SHOULD BE APPLIED IN A WAY THAT ENSURES ALL, OR VIRTUALLY ALL, CUSTOMERS WITHIN A GIVEN MARKET HAVE SIGNIFICANT ALTERNATIVES?

A. First and foremost, such an approach is consistent with the pro-competitive goals of the Act and this Commission. To date, UNE-P has proven to be the most successful and widespread vehicle for providing mass-market customers with competitive

[102] *Id.* at n. 1552.

alternatives to the incumbents' retail local exchange services. By its very nature, UNE-P allows competitors to offer alternatives to each and every customer that the ILEC serves. Eliminating access to unbundled switching is inherently anti-consumer unless the Commission can be very sure that *all* of the customers who can be served via UNE-P can also be served through some alternative form of competitive entry.

Q. IS IT YOUR TESTIMONY THAT THE ILEC MUST DEMONSTRATE THAT POTENTIAL TRIGGERING COMPANIES ARE CURRENTLY OFFERING RETAIL LOCAL EXCHANGE SERVICES TO (OR WHOLESALE SERVICES THAT ALLOW POTENTIAL RESELLERS TO REACH) EVERY SINGLE MASS-MARKET CUSTOMER IN A GIVEN WIRE CENTER?

A. No. The Commission should, however, require evidence that: (1) each company counted toward the retail trigger has a demonstrated capability of holding itself out to provide retail local exchange service to all, or virtually all, mass-market customers within that wire center; and (2) the volumes at which the potential triggering company is presently providing service demonstrate that it has overcome the hot cut barrier to entry that is the basis for the national finding of impairment and all of the other economic and operational barriers to entry that the FCC identified as appropriate topics for consideration in a potential deployment analysis.[103] I have included these two evidentiary requirements as the sixth and seventh, respectively, on the flowchart in Exhibit RC-3.

[103] This means that the company in question must have demonstrated, by the sheer scale and scope of its participation in the market, that it has overcome the operational and technological issues associated with, *e.g.*, UNE-L, OSS, collocation, transport and EELs necessary for mass-market entry. If that is not unambiguously clear from the nature of the triggering company's operations, then a potential deployment analysis would be necessary to justify a finding of no impairment and no such finding should be made on the basis of the existence of the alleged trigger company in the relevant market.

Q. ARE THERE BROAD CATEGORIES OF POTENTIAL TRIGGERING COMPANIES THAT WOULD FAIL TO MEET YOUR PROPOSED STANDARD OF HAVING A DEMONSTRATED CAPABILITY OF HOLDING ITSELF OUT TO PROVIDE RETAIL LOCAL EXCHANGE SERVICE TO ALL, OR VIRTUALLY ALL, MASS-MARKET CUSTOMERS WITH THE WIRE CENTER (ITEM 6 ON THE FLOWCHART IN ATTAHCMENT RC-3)?

A. Yes. As I mentioned in discussing product market distinctions, at least two broad categories come to mind:

1. Companies that serve business only, including small business, but do not serve residential customers; and

2. Companies that serve customers whose ILEC loop is provided over all-copper facilities, but do not serve customers whose ILEC loop is provided over fiber feeder and IDLC.

Q. WHY DO YOU SAY THAT COMPANIES THAT DO NOT SERVE RESIDENTIAL CUSTOMERS IN A GIVEN GEOGRAPHIC MARKET SHOULD *NOT* BE CONSIDERED AS POTENTIAL "TRIGGERING" COMPETITORS?

A. As I have already explained, residential customers differ from small business customers, who in turn are not identical to the medium and larger businesses that the FCC has included in what it describes as the "enterprise market."

The FCC recognized the "swing" role of small business customers in the distinctions it drew between "mass market" and "enterprise market" customers, noting:

> Very small businesses typically purchase the same kinds of services as do residential customers, and are marketed to, and provided service and customer care, in a similar manner. Therefore, we will usually include very small businesses in the mass market for our analysis. We note, however, that there are some differences between very small businesses and residential customers. For example, very small businesses usually pay higher retail rates, and may be more likely to purchase additional services

such as multiple lines, vertical features, data services, and yellow page listings. Therefore, we may include them with other enterprise customers, where it is appropriate in our analysis.[104]

This statement, in combination with the FCC's observations on the use of actual marketplace deployment as evidence that barriers to entry are surmountable, suggests that the Commission should allow the empirical evidence to dictate its view of whether residential and small business customers are in the same market for purposes of the trigger analysis. If a carrier serves small business customers but not residential customers using its own switch, that very fact implies that there is a meaningful difference between small business and residential customers. If that pattern is repeated, so that multiple carriers serve small business customers but not residential customers using their own switches, the evidence for distinct customer class markets becomes even more compelling.

It would be a grave public policy error to base a finding of no impairment solely or largely on evidence of carriers self-deploying switching to serve small business customers, leaving Washington residential customers with no meaningful competitive alternative. **The Commission should require evidence that both residential and small business customers have competitive choices before it decides to eliminate CLECs' access to unbundled switching in any geographic market.** Thus, a company that is not actively providing residential service with its own switches (*i.e.*, one that is only providing business service) should not be counted as a trigger company for mass-market switching.

[104] *Triennial Review Order* at n.432.

If the Commission does not apply the trigger analysis in this manner, then it must consider defining separate markets for residential and small business customers to avoid the public policy harm that I describe above. The small business submarket would include all business customers up to the identified boundary between mass-market and enterprise customers. I discussed the latter boundary in Section III.E above.

Q. YOU ALSO SUGGESTED THAT THE COMMISSION SHOULD CONSIDER WHETHER THE SWITCH-BASED COMPETITOR IS OFFERING SERVICE OVER BOTH ALL-COPPER AND IDLC LOOPS. WHY IS IT IMPORTANT FOR THE COMMISSION TO CONSIDER THE TYPES OF UNE LOOPS OVER WHICH POTENTIALLY TRIGGERING COMPANIES ARE PROVIDING RETAIL LOCAL EXCHANGE SERVICE?

A. ILECs and CLECs have engaged in a long and contentious battle over the procedures and cost for providing stand-alone unbundled loops to customer locations that the ILEC serves via fiber feeder and IDLC. To date, there is no consensus on a cost-effective means for making such loops available. There is, however, no dispute that UNE-P can be provisioned over the same IDLC facilities that the ILEC uses to provide its own retail services. Unless a potentially triggering company is providing switch-based services to mass-market customers over IDLC as well as all-copper loops, there is no actual marketplace evidence that the competitor has overcome barriers to entry for customer locations served via IDLC. Elimination of access to UNE switching under these circumstances would effectively deny competitive alternatives to the growing number of Washington customers served via IDLC.

Q. HOW DOES THE PRECEEDING DISCUSSION RELATE TO THE FLOWCHART IN EXHIBIT RC-3?

A. I have identified two specific "screens" that should be considered during the analysis that occurs as part of Item 7 in the flowchart. The first "screen" asks whether the potential triggering carrier serves both residential and small business customers. The second asks whether the potential triggering carrier serves customers over both all-copper and IDLC loops. The Commission should not consider the triggers to be satisfied unless all customer groups within the identified market can be reached by at least three retail or two wholesale providers that deploy their own switches.

C. Conclusions

Q. WHAT CONCLUSIONS HAVE YOU REACHED REGARDING THE MARKET-BY-MARKET APPLICATION OF THE RETAIL TRIGGER TEST?

A. The vast majority of wire centers in Qwest's Washington serving territory clearly do not satisfy the retail trigger test. Such actual deployment as exists in those wire centers certainly does not support the bright line determination that "no impairment exists" and there is no need to proceed to analysis of potential deployment, which would be implied by satisfaction of the retail trigger. For some wire centers my analysis is not yet conclusive as to whether the retail trigger is or is not satisfied. I will continue to examine further responses to discovery as they become available, as well as conduct other research into the nature of market participation of various potentially triggering companies. Further, I will evaluate Qwest's claims of no impairment and its supporting data in my reply testimony.

V. POST-TRIGGER ANALYSIS OF OPERATIONAL AND ECONOMIC BARRIERS

A. Markets Where Triggers Are Satisfied

Q. PLEASE EXPLAIN THE "EXCEPTIONAL CIRCUMSTANCES"[105] THAT MAY COME INTO CONSIDERATION IF THE TRIGGERS ARE MET?

A. If the Commission should deem that the triggers are satisfied in a particular market, the *Triennial Review Order* allows for the consideration of "exceptional circumstances" that still might prevent further entry. The FCC described these as follows:

> *Exceptional Sources of Impairment.* In exceptional circumstances, states may identify specific markets that facially satisfy the self-provisioning trigger, but in which some significant barrier to entry exists such that service to mass market customers is foreclosed even to carriers that self-provision switches. For example, if there is no collocation space available for additional competitive LEC equipment, further competitive entry may be impossible, irrespective of other economic or operational circumstances. Where the self-provisioning trigger has been satisfied and the state commission identifies an exceptional barrier to entry that prevents further entry, the state commission may petition the Commission for a waiver of the application of the trigger, to last until the impairment to deployment identified by the state no longer exists.[106]

Q. HAVE YOU PERFORMED AN ANALYSIS OF "EXCEPTIONAL CIRCUMSTANCES" ON A MARKET-BY-MARKET BASIS?

A. Not at this point. I have not yet identified any markets in Washington that satisfy the retail trigger threshold. I will evaluate Qwest's claims of no impairment and explore exceptional circumstances in Second Round testimony if warranted.

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[105] These exceptional circumstances are described in the *Triennial Review Order* ¶ 503

[106] *Id.* ¶ 503.

B. Markets Where Triggers Are Not Satisfied (Potential Deployment)

Q. PLEASE DESCRIBE THE ANALYSIS REQUIRED TO EVALUATE THE PROSPECT OF POTENTIAL DEPLOYMENT.

A. As I explained earlier in my testimony, in the absence of clear evidence of no impairment in the form of actual self-provisioning by CLECs that satisfies the "bright-line rule" of the FCC's prescribed trigger analysis, the analysis proceeds to the possibility of potential deployment to test whether barriers to entry without unbundled access to a network element are "likely to make entry into a market uneconomic," or whether the market in question is "suitable for 'multiple, competitive supply.'"[107] This analysis must be conducted on a market-by-market basis, analyzing the same markets that are used in the trigger analysis. At this stage of the analysis, the Commission must consider any local switching capacity of market participants identified in the trigger analysis in concert with an analysis of operational and economic barriers to entry.

Analysis of potential deployment must consider CLEC costs and anticipated revenues, as well operational issues such as deficiencies in ordering or provisioning of UNEs in order to determine whether entry in a particular wire center is likely to be profitable.

Q. WHAT FACTORS ENTER INTO A POTENTIAL DEPLOYMENT ANALYSIS?

A. The potential deployment test is essentially a feasibility test based on the Commission's prediction about a CLEC's investment decisions. Namely, will an efficient CLEC decide to deploy facilities to substitute for UNE switching, after

[107] *Id.* ¶¶ 84, 506.

evaluation of the potential for profit and the need to overcome operational and economic barriers to entry?

The barriers to be considered are not only economic barriers. Operational barriers must be considered as well. MCI witnesses Mark Stacy and Cedric Cox will address these operational barriers in considerable detail in their testimonies. These operational barriers should also enter into any economic analysis. Even if a CLEC determines that operational barriers are not insurmountable in and of themselves, the CLEC must take account of the expected cost and extra risk associated with overcoming these barriers in making a decision of whether to enter.

Q. PLEASE DESCRIBE THE CONSIDERATIONS THAT ENTER INTO A CLEC'S DECISION TO DEPLOY SWITCHING FACILITIES.

A. To determine whether to enter a particular market using UNE-L, a CLEC must first assess the operational barriers. A CLEC will not even consider making the substantial investment involved in UNE-L service until it is persuaded that available systems are sufficient to provide the service it wishes to provide, and until it is able to evaluate the costs involved in overcoming operational barriers.

As stated in Mr. Stacy's and Mr. Cox's testimonies, the most substantial operational barrier faced by UNE-L entry concerns development of adequate and appropriate operations support systems ("OSS"). The OSS required for processing CLEC orders for UNE loops are significantly more complex than those required for UNE-P orders, and the prospect of inadequacies in those systems impose significant financial risks to any CLEC deploying facilities for UNE-L based service.

In their testimonies, Mr. Cox and Mr. Stacy explain the primary differences between the demands on OSS for UNE-P and UNE-L orders. UNE-P orders can be processed electronically, requiring no physical rearrangement of components of the network. On the other hand, an order to change a customer's service from Qwest to a CLEC using UNE-L requires orders to (1) disconnect the customer's loop from its termination on the ILEC's switch and connect that loop to CLEC equipment in its collocation space, (2) change the customer's record in the number portability database to reflect that the customer's number is now associated with the CLEC's switch, and (3) update 911 and 411 records. Additional internal CLEC processes are required to establish connectivity from the collocation space to the CLEC's switch, and to establish the customer's service within the CLEC's switch and in its billing systems.

Further, it is critical that these processes be closely coordinated. A failure to coordinate very often results in a disruption of the customer's telephone service. It is likewise critical that the operations support systems in place to process these orders be reliable and predictable, and that they be scalable to allow for a large-scale transition of customers from UNE-P to UNE-L based service, and to handle subsequent migration of customers among competing carriers. In addition to the costs incurred to ensure that this process works smoothly, a CLEC considering self-deployment of switching facilities will evaluate the possibility of failures in operational coordination, and the risks associated with such failures.

The cost of these operations support systems, and the risk that such costs may not be recoverable, constitutes a substantial barrier to entry. Some of these systems, such as systems for tracking the assignment of transport trunks and systems for entering customer

records into CLEC switches, will be employed in the CLEC's overall operations, and will be usable in each geographic market that the CLEC decides to enter. The cost of other systems, such as interfaces to the number portability and 411 and 911 databases, may vary from region to region. In evaluating the profitability of UNE-L based local service, the CLEC will consider whether its potential customer base, both nationally and in specific geographic markets, is sufficiently large that the CLEC can reasonably expect to recover the costs of developing and implementing its operational support systems.

Q. HOW DO THESE OPERATIONAL BARRIERS RELATE TO THE TRIGGER ANALYSIS AND POTENTIAL DEPLOYMENT ANALYSIS IN THIS PROCEEDING?

A. My understanding is that many of these barriers have not been overcome. I stress, therefore, that the Commission must place a high burden of proof on Qwest to present evidence that its trigger candidates have demonstrated the ability to overcome these operational issues both as a technical matter and as a cost matter. Trivial volumes of UNE-L service may be sold to "small businesses" that are actually outposts of large enterprise customers, and for that reason, may represent "loss leaders" that UNE-L providers accepted as part of the price of securing a highly profitable large enterprise contract. Such entry cannot demonstrate that barriers to serving residential or truly small businesses have been overcome, and such firms should not be counted as satisfying the retail trigger.

As to the analysis of potential deployment – essentially an analysis of feasibility of entry – *operational* feasibility is a logical precursor to analysis of *economic* feasibility. If it is not technically and operationally feasible to provide mass market UNE-L service, then we must conclude that the provision of such service is economically infeasible,

without any need to examine the costs or revenues that might be associated with a business plan that is not operationally feasible. If the plan is operationally feasible only with extraordinary expenditures undertaken to cure apparent operational infeasibility, such expenditures could be taken into account in the analysis of economic feasibility. I am not aware of any attempt to estimate any such extraordinary costs that may be required to bring UNE-L mass-market service to operational feasibility. In the absence of such estimates, potential deployment analysis must proceed under the assumption, which I believe to be counterfactual, that mass-market UNE-L service is now operationally feasible.

Q. APART FROM OPERATIONAL BARRIERS, WHAT OTHER CONSIDERATIONS INFLUENCE A CLEC'S DECISION TO ENTER THE MARKET?

A. A CLEC will not enter a particular market unless it concludes it has a reasonable prospect of obtaining sufficient revenue from its customers both to defray its operating expenses and to recover any investments that it must make to enter the market. In other words, the CLEC must determine that it will make a profit taking into account likely revenues and costs. The CLEC must also take account of the risk that it may not make a profit despite its best estimate that it will. The greater the uncertainty, the less likely the CLEC is to enter.

The economic calculus may differ between the "hypothetical efficient entrant" that does not already have some investment in network facilities and established collocation facilities to serve a particular wire center, as distinguished from an actual carrier, such as MCI, that may already have some sunk investment in place. The

Triennial Review Order requires analysis of a generic hypothetical efficient entrant.[108] In a later section, I will address certain issues relevant to a carrier with sunk investments. I concur with the FCC's analysis and believe it is appropriate to focus on the perspective of a hypothetical efficient entrant, because it is the potential deployment of such entrants that must be evaluated to determine whether the market will support 'multiple, competitive supply.'"[109]

1. CLEC Costs

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section I will describe the costs that a CLEC would incur to obtain switching to support entry under a UNE-L strategy. I will also describe which of these costs are fixed and sunk, and which of these costs provide the ILEC with a cost advantage over the CLEC.

I begin by describing those costs that are identical (or similar) for a CLEC and ILEC. I then describe those costs that a CLEC would incur that an ILEC would not incur. To do this, I will compare the processes that the ILEC and CLEC must undertake to connect the exact same loops to their switches. It will be readily apparent that it costs the CLEC a great deal more than it does the ILEC to connect the loop to the switch, greatly raising the CLEC's costs. This is important, because, as explained above, it is well recognized that cost differences can be an important barrier to entry.[110] And because sunk

[108] *Id.* ¶ 517.

[109] *Id*. ¶ 506

[110] *Triennial Review Order* ¶¶ 87-90 (barriers include scale economies, first-mover advantages and absolute cost disadvantages).

costs can pose a particularly formidable barrier to entry, I will point out which costs confronted by a CLEC fall into that category.[111]

Q. WHAT CATEGORIES OF COSTS MUST BE CONSIDERED?

A. The broad categories of costs confronting CLECs entering the market using UNE-L are the costs associated with (1) switches; (2) the connections between loops and the switch; (3) collocation of the CLEC's facilities in the ILEC's wire center; (4) the cost of digitization, concentration and aggregation; (5) transport to the CLEC's switch; and (6), and the cost of cutting over the loops.

Q. WHY IS IT APPROPRIATE TO USE TELRIC COST ESTIMATES?

A. The TELRIC standard has been designed to estimate the cost that would be incurred by an efficient carrier serving the relevant demand in the relevant market, using the most efficient currently available technologies and methods. As such, it comports with the FCC's directive that, in considering potential deployment of switching and transport facilities, the Commission's deliberations should be based on cost that would be faced by an efficient carrier.[112]

Q. WHAT LOOP COST WOULD THE CLEC CONSIDER?

A. The cost of loops that must be considered is the rate established by this Commission in each of the UNE rate zones. Thus, for each wire center, the UNE rate applicable to the rate zone to which the wire center is assigned is the cost to the CLEC of providing the loop portion of local exchange service. In addition, the cost of

[111] *Id.* ¶ 88.

[112] *Id.* ¶ 517

interconnection between Qwest's facilities and the CLEC's collocation space, or to Enhanced Extended Loop ("EEL") facilities must be considered.

Q. PLEASE DISCUSS THE COST OF SWITCHES.

A. A CLEC evaluating the possibility of deploying facilities to provide UNE-L service must consider the cost of the switch. Switches are readily available from the various switch manufacturers as well as in secondary markets. Unlike many of the other costs faced by the CLEC, the cost of the switch is predictable and consistent (for any given level of demand) for all geographic markets that the CLEC might contemplate entering. And, although much of the price of a switch constitutes a fixed cost, since it is necessary to purchase an entire switch processor and switch matrix to serve even one customer, it is largely not a sunk cost because the switch could sold in the secondary market if the CLEC is forced to exit the market. (As discussed below, however, the cost of installing and configuring the switch is typically a sunk cost.)

Although local exchange switches are readily available and can be rapidly deployed, the CLEC must evaluate, on a market-by-market basis, whether the potential customer base is sufficiently large that the CLEC can expect to recover the costs that will be sunk in installing and configuring a switch. Parts of modern switches (*e.g.,* line units and line cards) are designed to be scalable to customer demand; thus, the corresponding portion of the cost of switches is variable with respect to the number of customers served. Nevertheless, there may still be significant sunk costs incurred before the first customer can be served. These costs include engineering costs; the costs of purchasing, transporting, and installing the switch; the costs of acquiring space to house the switch and to supply it with power, climate control, and necessary testing equipment.

By using a per-line investment input (with a simple mark-up for land and building investments and other ancillary costs), a potential deployment analysis can incorporate any economies of scale that may be present in provision of the switching function. In effect, in effect, this approach assumes that CLEC customers can be served by a switch located in such a way as to take full advantage of economies of scale in switching, without regard to the actual location of those customers. This approach obviates any concern that my wire-center market definition might be too narrow to allow the CLEC to take advantage of pertinent economies of scope and scale in switching.

Q. PLEASE DISCUSS THE COST OF THE CONNECTION BETWEEN THE LOOP AND THE CLEC SWITCH.

A. In addition to the costs of the loop and the switch, the CLEC must incur substantial costs to connect the leased loop to its switch – costs that the ILEC does not have to incur. These costs will vary for every wire center. These costs include the cost of establishing the collocation space and equipping that space with the necessary electronics to terminate purchased UNE loops, and the cost of establishing transport facilities to carry customer traffic from each collocated ILEC wire center to the CLEC's switch location. In both instances, the costs include non-recurring charges imposed by the ILEC for establishing collocation and transport arrangements, as well as costs incurred by the CLEC for engineering and purchasing loop termination and transport equipment. These costs too are both sunk and fixed costs. Significantly, these are costs that are not incurred by the ILECs.

Q. PLEASE DISCUSS THESE COSTS IN GREATER DETAIL.

A. Voice telephone service has traditionally been provided by connecting a customer's premises to the ILEC's central office with a twisted pair of copper wires (i.e., the local loop). The local loop terminates in the central office on a Main Distribution Frame ("MDF"). The local loops terminate on one side of the frame, the "customer facing side." On the other side of the frame – the "network facing side," short wires (referred to as "jumper wires") connect to ports on the ILEC's switch. This configuration allows for easy and flexible connections between loops and the local switch. The connection between the local loop and the ILEC switch consists of a single jumper wire, running from 15 to 100 feet in length. The cost of providing this jumper wire is very small, probably on the order of 2¢ a month.

This simple, inexpensive connection to the ILEC's switch is possible because the local network architecture was specifically designed and engineered to permit efficient and economical loop access to a monopoly local carrier. The placement of ILEC central offices, and the configuration of the wires that connect these offices to the homes and businesses they serve, was based in part on engineering considerations. For instance, the ILECs' networks were designed to limit the length of most copper loops to 15,000 to 18,000 feet, to avoid having to add equipment to enhance the quality of the voice signal. Outside of rural areas, this allowed the ILECs to deploy switches that were sufficiently large to take advantage of scale economies.

To provide comparable service, the CLEC offering UNE-L service must substitute for this jumper wire a much more complex physical connection between the MDF and its own switch. This is so because the CLEC switch will never be located as the

ILEC switch is, 15-100 feet from the ILEC main distribution frame. It would be economically impossible for a CLEC to install a switch of its own at or near each ILEC central office, because those CLEC switches would serve too few customers to be cost-effective. Neither is it possible to collocate Class 5 switches in the existing ILEC offices, both because of space limitations and because existing rules do not permit it. Hence, unlike the ILEC, the CLEC cannot use an inexpensive 100-foot copper jumper to connect the local loop to its own switch. Rather, a CLEC must locate its switches in central locations and transport the traffic from the loop to that centralized location.

That transport involves a great deal more than simply connecting a very long jumper wire to connect the loop to the CLEC switch, for two reasons. First, because of the transmission characteristics of pairs of copper wire, the signal would be unlikely to survive this form of transport to the distant CLEC switch. Second, even if this technical limitation were ignored, it would be very costly and inefficient to run so many wire pairs from the various central offices the entire distance to the CLEC's centralized switch.

Thus, instead of connecting a simple jumper cable, the network operations necessary for CLECs to connect UNE loops to CLEC switches involve four stages. First, the CLEC must rent space in the ILEC's central office to "collocate" its own network equipment. Second, the CLEC must purchase and install electronic equipment in the collocation space that converts the analog loop signal into a digital signal, and at the same time aggregates and concentrates multiple loops into more efficient copper or fiber transmission facilities. Third, the CLEC must purchase or construct transport facilities to carry the traffic to its switch location. Fourth, when all of these connections are established, the ILEC and CLEC must coordinate a "cut over" of the loop from the

ILEC's main distribution frame to the "POTS bay" at the CLEC's collocation space. I will describe each of these processes and discuss the type and nature of the costs involved in each step. The FCC recognized that an analysis of each of these costs is important to determine whether entry is economic.[113]

Q. PLEASE DESCRIBE THE COST OF COLLOCATION.

A. The first thing a CLEC must do to provide UNE-L telephone service is to obtain collocation space at the ILEC central office at which the customer's loop terminates. Collocation is basically the rental of a small portion of central office space in which a CLEC may house its equipment. There are three forms of collocation—(1) physical, caged collocation, (2) physical, cageless collocation, and (3) virtual collocation. Physical collocations are spaces assigned within an ILEC central office in which a CLEC can deploy its own hardware and equipment. The individual spaces are generally caged (*e.g.*, enclosed by meshed wire), to provide security. In physical, cageless collocation, a CLEC is generally assigned space in the ILEC's common equipment room where the CLEC can deploy its own equipment, but this space is not enclosed. In virtual collocations, CLECs purchase equipment; however, the ILEC takes ownership of the equipment (and responsibility for maintenance) and installs the hardware in the ILEC's equipment lineup. The type of collocation selected by a CLEC is often driven by the availability (or lack thereof) of space in a given central office. Establishing the collocation involves a number of activities that will vary depending on the type of collocation established.

[113] *Triennial Review Order* ¶ 481, ¶ 484 n.1497, ¶ 520.

Q. PLEASE DESCRIBE THE ACTIVITIES INVOLVED IN ESTABLISHING A COLLOCATION.

A. In general, these activities include: (1) obtaining the necessary space in the ILEC's central office; (2) engineering the collocation; (3) arranging with the ILEC to provide the collocation (for physical caged collocations) as well as fire protection, heating, ventilation and air conditioning ("HVAC") and power, or, in, the case of a virtual collocation, to install the necessary equipment in ILEC-controlled space; and (4) establishing and pre-wiring the "POTS bay," which enables loops from the ILEC MDF to be connected to the CLEC's equipment at the collocation.

Q. PLEASE DISCUSS THE NATURE OF THE COSTS ASSOCIATED WITH THESE ACTIVITIES.

A. While the cost of each element of establishing or continuing in a collocation arrangement is usually well defined by a tariff, Statement of Generally Available Terms and Conditions ("SGAT"), or interconnection agreement, determining the cost of collocation for a particular entry plan may be difficult and subject to substantial uncertainty. CLECs need to obtain direct current ("DC") power and emergency power from the ILEC to operate collocated equipment, and the nature of these arrangements can vary substantially. The specific equipment needed to provide this functionality includes the battery distribution fuse bay ("BDFB") and the DC power cabling that is extended from the BDFB to the collocation arrangement. The BDFB is a large fuse bay or junction point where a large feed of DC power from the ILEC's power plant is broken down into smaller power units. The DC power cabling, consisting of copper cables in protective sheaths, is necessary to complete a power circuit from the BDFB to the collocation arrangement. In some cases, the CLEC may install its own BDFB in the collocation

arrangement. In cases where it does not, it will usually install its own fuse and alarm panel in the collocation cage. Further, as described in the Transport section below, in most situations, a second collocation cage and transmission equipment are required to further aggregate traffic for the purpose of efficiently "backhauling" traffic from ILEC central offices to the CLEC's switch.[114]

It can cost the CLEC in the range of $75,000 to $150,000 to establish a collocation, and up to several thousand dollars in monthly fees to use a collocation. The impairment analysis tool calculates the cost of collocation by considering the number and type of lines that must be connected from the ILEC's main distribution frame and DLC systems to the CLEC's collocation space, and calculates, based on the ILEC's UNE tariffs, interconnection agreements, or SGATs, as appropriate, the cost not only of establishing and equipping the collocation space, but also the cost of connecting individual customer lines from the ILEC to the CLEC. Some of these costs are incurred as monthly recurring costs, and are incorporated into the cost analysis directly as a monthly cost per line. Other costs are incurred either as non-recurring charges imposed by the ILEC, or are incurred by the CLEC as capital investment. In some cases, these costs are treated as a one-time expense that is amortized over a user-adjustable period of time. In other cases, particularly in the case of capital investments, the asset is depreciated over an appropriate economic depreciation life, and the capital carrying cost of the asset is included as a part of the monthly cost per line.

[114] For a "cageless" collocation, some of the ILEC make-ready work is unnecessary.

Q. PLEASE DESCRIBE THE CHARACTER OF THESE COSTS AS SUNK, FIXED, ETC.

A. A substantial portion of collocation costs is fixed, i.e., there is a large cost associated with providing service to the first UNE-L customer served. Moreover, most of the up-front costs are sunk, which means they cannot be recovered if the CLEC exits the market. As discussed in the *Triennial Review Order*, the existence of substantial sunk costs creates a significant entry barrier, which has profound effects on UNE-L competition.

Q. PLEASE DISCUSS THE COSTS OF DIGITIZATION, CONCENTRATION AND AGGREGATION.

A. As a consequence of the CLEC's need to place its switch at a substantial distance from the ILEC's wire center, it must install in its collocation space equipment that digitizes and encodes the analog signals delivered over the customers' loops to that collocation space. The equipment used to perform this function is sometimes referred to as DS0 (that is, voice grade) equipment infrastructure. This equipment includes DLC equipment, high capacity digital cross-connection frames (DSX or DACS), power distribution and remote test equipment.

The DLC equipment is the equipment that receives the analog communications from the loop via the POTS bay and both digitizes and concentrates the communication for transmission to the CLEC's switch. Digitization of the analog signals from the loop is necessary in order to interface the signal efficiently with the fiber optic transmission facilities that are used in interoffice transmission paths. Concentration of the signal permits the CLEC to more efficiently use interoffice transmission capacity. The DLC also interoperates with the CLEC switch to provide and receive signaling necessary for

call supervision, including the provision of dial tone and ringing current, digit reception and related functions.

The CLEC must also install other equipment at the collocation to provide UNE-L service. A digital cross connection frame (or DSX-3) is needed to connect the DLC and the transport facility. In addition, a CLEC needs to install equipment that enables it to monitor its collocation equipment remotely, thereby permitting the CLEC to maintain its equipment and to diagnose and subsequently repair any service disruptions that may occur.

Q. PLEASE DESCRIBE THE NATURE AND EXTENT OF THESE EQUIPMENT COSTS.

A. As in the case of the collocation costs, there are substantial fixed costs associated with these functions. The largest costs are for the DLC equipment, which even at its smallest size costs approximately $20,000. This input, as well as many of the other investment inputs used in the impairment analysis tool are those proposed by Dr. Gabel in the original version of the NRRI model. These in turn were derived from a variety of industry sources, including the FCC's synthesis model and various *ex parte* presentations made to the FCC by representatives of both CLECs and ILECs. And even if a CLEC can use the smaller DLC equipment efficiently, it will not be able to operate at the lowest possible cost unless it can achieve sufficient volume to capture the scale economies inherent in DLC technology.

The engineering and installation cost for these functions are sunk once they are committed to a particular central office. The purchase prices of the DLC and other equipment are not sunk with respect to the provision of service at a particular location,

because they could be moved elsewhere. Nevertheless, if the CLEC were to exit the market entirely, it might have a hard time recovering substantial portions of the equipment cost if UNE-L-based service failed to succeed across much of the CLEC industry.

Q. PLEASE DISCUSS THE COST OF TRANSPORT TO THE CLEC'S SWITCH.

A. Once the CLEC customers' signals have been prepared for transport to the CLEC switch, the CLEC must arrange for transmission facilities to deliver traffic from the collocation to its switch. In most cases, a CLEC will not be able to use its own network facilities to connect the collocation to its switch because the traffic volumes present at a given collocation are typically too low to afford the economies of scale necessary to justify CLEC construction of transport facilities solely for this purpose. Rather, the CLEC will use the ILECs' transport facilities to connect its collocation either directly to its switch or to a "hub" location at which traffic from several sub-tending collocations in the area are aggregated and subsequently transported to the CLEC's switching location. Given appropriate traffic volumes, this hub location may be connected to the CLEC's switching office via the CLEC's own optical fiber transport facility. In either case, whether purchased from the incumbent or self-provisioned by the CLEC, a CLEC must procure transport facilities between its collocations and switching locations to backhaul customer loops to its switch.

There are some sunk costs associated with providing transport for UNE-L based local service. If the CLEC leases transport from the ILEC, there will be sunk costs associated with any nonrecurring charges, term commitment plans, and any costs

associated with "grooming" circuits to handle increased and/or changed traffic demand. If the CLEC has transport facilities already in place, then its costs were sunk before it decided to provide UNE-L based local service.

The CLEC will face significant scale effects on transport leased from the ILECs. Most transport tariffs provide substantial volume discounts, and unless the CLEC has enough traffic to utilize a DS3 or higher circuit, it will pay a high per unit cost for using DS1 circuits. Also, because transport circuits are provided in "lumpy" amounts (for example a DS1 circuit can carry 24 voice grade circuits, but the next larger size circuit, a DS3, carries 672 voice grade circuits), a CLEC will be less likely to use transport facilities efficiently, the smaller its total demand for transport.

Q. PLEASE DISCUSS THE PROCESS AND COSTS ASSOCIATED WITH CUTTING OVER THE LOOP SERVING A CUSTOMER CHOOSING TO BE SERVED BY A UNE-L BASED CLEC.

A. Once the necessary network infrastructure is in place, the CLEC is in a position to connect individual customer loops to its collocation (and ultimately to its switch). To accomplish this, the CLEC must arrange for what is typically referred to as a coordinated hot cut. The hot-cut process involves multiple activities that require coordination among both CLEC and ILEC personnel and includes, among other things (1) physically moving the CLEC customers' loops from the ILEC MDF to the POTS bay at the CLEC collocation and (2) coordinating the porting of the customer's telephone number to the CLEC's switch so that calls dialed to the customer's number can be properly completed. Once the hot-cut has been successfully completed, a CLEC can then provide service to its end-user using its own switch.

The cost of the hot cut required to serve a particular customer amounts to an investment the CLEC makes to acquire the stream of revenue it expects to receive from that customer. As such, the investment loses its value entirely if the customer switches to another provider. The CLEC must therefore recover this cost within the period over which it can expect to retain the customer. Thus, the average period over which a CLEC can expect to retain a customer is the appropriate amortization period for customer acquisition costs, including hot cut costs. As such, the average customer life, or retention period, is a crucial element of the cost that a CLEC must evaluate in deciding whether to deploy facilities for UNE-L service or not. This average customer life is conceptually related to the concept of "churn" experienced by telecommunications companies, even in a monopoly environment, as customers enter and leave the provider's serving area, and move from place to place within the serving area. Estimates of churn can be significant in some conventional cost studies, but churn in a monopoly environment is relatively stable and subject to fairly reliable approximations. Very much to the contrary, average customer life in a competitive environment depends on the nature of competition. In this case, the competitive environment to be considered is the environment after UNE-L based entry. While we have good reason to believe that the character of competition will be significantly different after UNE-L based entry – because a UNE-L competitor will have incurred greater sunk costs and face much lower marginal costs than a UNE-P based competitor – the precise character of that competition, and its implications for average customer life, must remain subject to a great deal of uncertainty. While conventional economic models are available to approximate market prices, hence expected revenues after entry, conventional economic modeling has little to say about the likely dynamics of

competition after entry. This uncertainty is relevant, not only to the present modeling exercise, but to the CLEC's evaluation of risk associated with potential deployment of facilities to support UNE-L based service.

2. Anticipated Revenues

Q. PLEASE PROVIDE AN OVERVIEW OF THE PROCESS YOU USE TO ESTIMATE REVENUE.

A. First, it should be clear that the revenue estimate that is relevant to a CLEC considering potential deployment will be the revenue the CLEC expects to recover in the market ***as it will exist*** after UNE-L based competition has become established. Thus, an appropriate estimate of revenue to evaluate potential deployment is an estimate of future revenue in a different competitive environment than exists today. After forming estimates of costs and revenues that may obtain after deployment of facilities for UNE-L based provision of service, a CLEC considering potential deployment would compare future net revenues to the initial cost of entering the market.

Q. YOU STATED THAT REVENUE PROJECTIONS SHOULD BE BASED ON FUTURE REVENUES UNDER A DIFFERENT COMPETITIVE REGIME. PLEASE EXPLAIN.

A. To determine whether to serve a market using UNE-L, the CLEC must consider not only its costs, it must also consider the likely revenues from the services it offers, including all categories of potential revenues.[115] Economic theory predicts that a CLEC will enter and compete against the ILEC only if the CLEC can expect to earn sufficient profits post-entry to enable it to earn an adequate return on the cost of the capital that it must commit to enter the market, recognizing the risk associated with the investment.

[115] *Triennial Review Order* ¶¶ 484-85.

Given the CLEC costs discussed above, and given the retail rates the competitor will be able to charge, the competitor may or may not be able to recover the costs it would have to incur to enter the market in the first place, in addition to the incremental cost of providing service.

In other words, before it enters a market, a competitor would need to understand its costs, estimate the revenue it would expect to receive, and determine whether entry would be profitable. Its revenue projections would be based on the rates it could charge, accounting for the effect of entry on competition, and the number of customers it expects to purchase its services. And, its rates are highly dependent upon the rates the other market participants would charge for substitutable services. The CLEC's price must be competitive with the ILEC's if the CLEC is to be successful. A CLEC considering potential deployment cannot rationally assume it will be able to charge $40 for phone service in Washington if Qwest is likely to respond to entry by offering a similar service for $35.

Q. IS IT REASONABLE TO BEGIN YOUR ANALYSIS OF ANTICIPATED REVENUE WITH THE ILEC'S EXISTING RATES?

A. Yes, but only as a starting point. The ILEC's existing rates represent the highest conceivable rates that a CLEC might hope to charge after entry, and for reasons discussed below, it is not really plausible that those rates could be maintained after UNE-L competition becomes established.

Because a new entrant must generally offer rates that are no higher than those currently charged by the incumbent, existing retail rates are an optimistic starting point for any analysis of anticipated CLEC revenue. But, analysis of existing rates is only the

starting point. Firms contemplating entry into new markets rationally base their entry analysis on the prices they expect will prevail after they enter, and not on current prices. This proposition is widely accepted in industrial organization economics, and the FCC understood it to be an important factor in an impairment analysis.[116] Consideration of post-entry prices in calculating potential revenue is particularly important in the case at hand because the entrant (or entrants) will be adding new capacity to a market (new switches and new transport); unless other firms are willing to watch their facilities operate well below capacity, prices will have to fall, following the well understood rules governing supply and demand. Because there is no reason to believe that other firms in the market will act unilaterally to reduce output to fully offset the increase in capacity by the new entrants, prices certainly will fall unless the firms in the market collude to constrain capacity.

Q. ARE THERE REASONS SPECIFICALLY RELATED TO A TRANSITION FROM UNE-P COMPETITION TO UNE-L COMPETITION THAT SUGGEST LOWER PRICES AFTER ENTRY?

A. Yes. There are two reasons related to marginal costs of the ILEC and CLECs that strongly suggest price reductions as UNE-L competitors become established and replace UNE-P competitors. First, the costs of providing UNE-P service largely take the form of monthly charges for the required UNEs. These costs are not fixed or sunk costs, but vary with the number of customers served. These variable or marginal costs create a floor, below which a UNE-P competitor will never allow price to fall. If the UNE-P competitor

[116] *Triennial Review Order* ¶ 88 ("an entrant that knows that an incumbent LEC has incurred substantial sunk costs may be disinclined to enter a market because the incumbent LEC is likely to drop its prices, possibly to levels below average cost, in response to entry"). *See also id*. ¶ 75 n.250, ¶ 83, ¶ 157 ("telecommunications prices are not static, and will change over time in response to increased competition.").

cannot recover its marginal costs, which comprise the bulk of its costs, it will not offer service. On the other hand, a UNE-L competitor faces a substantially different cost structure. For a UNE-L competitor, a large portion of costs is sunk, and the marginal costs, those that vary with the number of customers served, comprise a smaller fraction of total costs. Thus, once the initial costs of entry have been "sunk" into the business, a UNE-L competitor will be willing to reduce price down to its lower marginal cost in order to acquire or retain customers. The urgency of covering the sunk cost of entry, which can only be accomplished by having customers that contribute something, even a small amount, above marginal cost, creates a competitive environment that is much more likely to involve substantial price reductions, than is the environment of UNE-P competition. So, under UNE-L competition, the CLECs face lower marginal costs and are under pressure to recover sunk costs by increasing volume.

When UNE-L competition becomes established, the ILEC also has a stronger incentive to win, or retain, a customer instead of having that customer served by a competitor. This is the case because the ILEC receives revenues related to a customer in two forms: If the customer chooses the ILEC at the retail level, the ILEC receives the retail price the customer pays for service. If the customer chooses a CLEC at the retail level, the ILEC still receives revenue for this customer, in the form of wholesale UNE revenue from the CLEC chosen by the end user customer. But the ILEC receives more UNE revenue from a UNE-P customer than from a UNE-L customer, as the UNE-P customer pays the ILEC for both switching and loops. In other words, the ILEC is worse off when a customer leaves it for a UNE-L CLEC than for a UNE-P CLEC and has a

greater incentive to win the customer back. As a result, the ILEC is likely to cut prices further in the face of UNE-L competition than UNE-P competition.

Finally, as the market matures, CLECs' offerings should come to be regarded as closer and closer substitutes to the traditional ILEC's offerings. In the early days of competition consumers' lack of familiarity with CLECs' services provides a source of product differentiation that leads to a less rigorous form of competition. As the different providers' offerings come to be regarded as perfectly good substitutes for each other, price takes on greater importance as the locus of competition, and entrants must anticipate corresponding reductions in market price. Potential entrants will also have to consider whether other firms will also enter the market at the same time that they do. More entry, at least when there are few firms in the market, generally will result in more aggressive price competition and lower market prices, which further reduces the post-entry profit margins of the entrants (as well as of the incumbent).

Q. BEYOND THE RELATIVELY SIMPLE NOTION OF "MARKET PRICE," WILL POTENTIAL ENTRANTS CONSIDER OTHER FACTORS?

A. Yes. A CLEC must consider what the prices are likely to be for particular types of customers in particular geographic markets. The revenue a CLEC is likely to earn is strongly affected by the ability of the incumbent to cut prices selectively in response to entry. The more the incumbent can fine tune its prices and target only those customers (by geographic area or other marketplace characteristic) where entry has occurred or is threatened, the lower the cash flows an entrant can expect. When the incumbent has greater ability to price discriminate, it has a greater incentive to cut prices in response to

initial, small-scale entry. The reason is that the incumbent does need not to lose profits by "unnecessarily" cutting prices to customers who have no competitive alternatives.

Q. WOULD SUCH SELECTIVE PRICE CUTTING AMOUNT TO PREDATORY PRICING?

A. Not necessarily. It is important to recognize that the incumbent does not need to set prices at predatory levels to deter future entry. Conventionally, predatory pricing is defined as pricing below variable or marginal cost, with the intention of driving competitors out of the market. In a case where entry requires substantial fixed and sunk costs and the incumbent can target price reductions, however, the incumbent can set prices at a level at which the entrant can recover its variable costs, but will not be able to recoup its sunk costs. In that situation, while the entrant will remain in the markets to which it already has committed, it will not recover its sunk costs in those markets, and will learn not to enter new markets and challenge the incumbent.

Q. HOW DO THESE CONSIDERATIONS ABOUT THE ILEC'S POST ENTRY PRICE AFFECT THE CLEC?

A. Once the CLEC has estimated the price the ILEC likely will charge for services when faced with competitive entry, the CLEC must consider the extent to which it will be required to offer service at a discount from whatever price the ILEC is willing and able to charge, or incur the cost of developing additional features to differentiate their product, in order to take business away from the incumbent. Customers cannot be expected to switch from the incumbent to the new entrant simply because the new entrant has entered the market. New entrants can only obtain customers from incumbents by pricing their services below the level of the incumbent's prices or by offering distinctive services at a higher cost. At lower prices, all else equal, the entrant will earn lower margins (i.e., will

receive less cash flow) from each of its customers than will the incumbent. The higher costs associated with product differentiation likewise will result in lower margins for the new entrant.

Q. IS IT POSSIBLE TO BE CONFIDENT OF THE PRECISION OF ESTIMATES REGARDING THE COMPETITIVE ENVIRONMENT AFTER UNE-L BECOMES ESTABLISHED?

A. No, it is inevitable that substantial uncertainty must accompany any estimates of the nature of competition after substantial UNE-L entry. For one thing, it is important to recognize that a formal model may overestimate the opportunity for CLEC entry. In calculating CLEC costs and revenue opportunities, it is necessary to make simplifying assumptions about the way in which a CLEC would operate in a world in which it relies on the ILEC to provide UNE loops and other network functions, but utilizes its own switches. For example, quantitative analysis of competitive interactions may assume that the ILECs provide UNEs to the CLECs on terms that are indistinguishable from their self-provisioning of these same elements. If this assumption is violated, then it is not possible to draw any conclusions from a quantitative analysis, for two separate and important reasons. This point cannot be overemphasized.

First, deficiencies in ordering or provisioning of UNEs will raise the CLECs' costs above estimated levels, possibly by a very large amount. Second, if ILECs provide poor service to the CLECs, then the CLECs' customers will perceive that the CLECs' services are inferior to the ILECs. I note that opportunities for things to "go wrong" and result in inferior service for CLECs are much greater in the more complicated UNE-L arrangement than with UNE-P. If things do "go wrong", there will be a reduction in

demand for the CLECs' services, which in turn will force the CLECs to either set lower prices or sell less service.

3. Evaluation of Model Results

Q. WHAT RESULTS DOES A POTENTIAL DEPLOYMENT MODEL PRODUCE, AND HOW SHOULD THE COMMISSION REGARD SUCH RESULTS?

A. The simplest result from any analysis of potential deployment is the net revenue for a "market," in the aggregate or on an average per line basis, for a "most likely" set of input values. Reporting such a simple number may be misleading, for at least two reasons: First, there is a great deal of uncertainty associated with such a "bottom line" number, and care must be taken not to overlook the uncertainty, or range of possibilities, surrounding the single number. Second, in the case of a market definition that encompasses more than one wire center, the number is an average of higher and lower values, which is likely to obscure impairment, or the absence of impairment, in the averaging process.

Q. PLEASE DISCUSS THE UNCERTAINTY ASSOCIATED WITH "BOTTOM LINE" RESULTS.

A. Some of the inputs to the modeling process are known with substantial accuracy. For example, the number of retail lines in service in a wire center is a good measure of the number of lines that a CLEC can compete for in that wire center. On the other hand, many inputs cannot be known in advance with any precision whatsoever. The share of lines in a wire center that a CLEC may actually win in an unprecedented UNE-L competitive environment is an example of an important input that cannot be known with very much accuracy. Generally, I regard inputs that arise from the post-entry competitive

environment as extremely uncertain. Such inputs include CLEC market share, prices or revenue per line, churn or average customer retention period, and several others. I believe that it is most reasonable to treat estimates of these input values as ranges, rather than single values, and the consequence of this treatment is that the bottom line for any market will also be a range. The Commission should recognize that any bottom line result from an impairment analysis is not a precise estimate, but rather, is an estimate that doesn't explicitly report the uncertainty associated with the result. In fact, a single result showing that entry is economically feasible in a particular market may mask an uncertain range of possible results that should weigh heavily in the Commissions deliberations. As I discussed above, the harm that would arise from an erroneous finding of no impairment is much greater than from an erroneous finding of continued impairment. In light of this asymmetry between possible consequences of the Commission's decision alternatives, the range of uncertainty associated with potential deployment results, and the consequent likelihood of an erroneous conclusion based on such results, I urge the Commission to insist that the evidence should be very clear before a finding of no impairment is reached.

Q. ARE THERE OTHER REASONS THE COMMISION SHOULD TREAT POTENTIAL DEPLOYMENT RESULTS WITH CAUTION?

A. Yes. First, as I indicated above, in the absence of estimates of extraordinary costs that might be needed to overcome operational barriers, potential deployment analysis proceeds as if operational impairment issues have been solved, which I do not believe to be the case. Second, a very small positive bottom line does not inspire confidence that the positive outcome is not an artifact of the estimation process in an unavoidably uncertain environment. Third, the barrier to entry associated with sunk costs and

uncertain environment must be considered.[117] A simplifying assumption necessary in most analysis of potential deployment is that entry will proceed smoothly and the CLEC will continue in the market *over the entire life of all investments undertaken*. This assumption is not problematic in an uncertain environment *if costs of entry are not sunk costs*. That is, uncertainty creates a real possibility that the CLEC may have to exit the market before completely amortizing its entry-related investments. Sunk cost is the portion of these investments that cannot be recovered in the event of market exit. If there were no sunk costs, a premature exit would only mean that this market turned out not be an opportunity, and the CLEC can take its investment to a more promising market. If some costs of entry are sunk, they cannot be recovered after exit, and the possibility of premature exit will be considered carefully by the CLEC, before it enters the market.

Q. DOES THIS AFFECT THE COST OF CAPITAL?

A. Yes. The cost of capital is one way to take some account of the entry barrier of sunk costs in an uncertain environment. For a given level of uncertainty, the greater the sunk costs associated with the investment, the riskier the investment. A firm considering undertaking costs that will be sunk upon commencement of an uncertain project such as UNE-L entry may use a much higher "hurdle rate" to evaluate the investment.[118]

[117] *Triennial Review Order* at n.244.

[118] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996; Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers*, CC Docket Nos. 96-98, 95-185, First Report and Order, FCC 96-325 ¶ 642 (August 1, 1996).

Q. PLEASE DISCUSS THE AVERAGING OF PROFITABILITY OVER MULTIPLE WIRE CENTERS THAT OCCURS WHEN A MARKET DEFINITION ENCOMPASSES MORE THAN ONE WIRE CENTER.

A. As I discussed above in Section III.D., potential deployment results based on a market definition that includes more than one wire center involves unnecessary aggregation, or averaging, over results based on data that "naturally" resides at the wire center level. This aggregation above the wire center level makes such results less practical than results based on a wire center market definition. More importantly, such results are misleading—blurring the line between profit and loss by mixing together dissimilar wire centers.

4. MCI Is Different

Q. WOULD ANALYSIS OF POTENTIAL DEPLOYMENT BE DIFFERENT FOR A HYPOTHETICAL CLEC THAN FOR AN ACTUAL CLEC, SUCH AS MCI, THAT WAS NOT STARTING FROM SCRATCH?

A. Under many circumstances analysis of the hypothetical CLEC would apply to the case of an existing CLEC like MCI. There are other circumstances in which an actual CLEC would face a different business case than the case of a hypothetical efficient CLEC. The main factors that would cause the situation of the actual CLEC to differ from the hypothetical CLEC are: (1) the CLEC is already serving large business customers in the same wire center with special access or UNE transport; (2) the CLEC is already collocated in the wire center; and, (3) in addition to being collocated, the CLEC also is connected to the collocation with its own transport facilities.

In the case of a CLEC already serving business customers at that wire center, but not yet collocated, there is the potential that it could build a new collocation to serve enterprise and mass-market customers. The benefit to the CLEC is that it could take

advantage of any economies of scale (or scope) in the costs of collocating and transport. This may cause some collocations that are marginally unprofitable for UNE loops alone to become profitable.

If a CLEC were already collocated in a wire center, it could benefit from certain economies of scale and scope. For example, some nonrecurring costs associated with the establishment of the collocation could be spread over a larger volume of business, and per-unit costs therefore may be lower. Also, it is possible that in the short-term the CLEC would have excess, unused capacity for some components, e.g. racks that are used for DS1 and DS3 customers. Even so, the CLEC would still have to have enough UNE-L customers to achieve economies of scale in many of the cost components related to its mass-market service. For example, DLC equipment is not used for DS1 and DS3 customers, and the CLEC would need enough customers to achieve scale economies in the use of this equipment.

The third case listed above, in which the CLEC reaches its collocation with its own transport facilities, would be even more favorable to UNE-L based entry by the CLEC. This is because the incremental cost to the CLEC of transporting traffic form UNE-L customers would be lower than when it must lease transport from the ILEC. Once again, this does not mean that the CLEC will always enter the UNE-L market, because it still must invest in additional collocation space and DLC equipment, and the decision would be made on a wire center basis.

Q. WHAT STEPS CAN THE COMMISSION TAKE TO INCENT FACILITIES BASED COMPETITION BY COMPANIES LIKE MCI THAT HAVE ALREADY ESTABLISHED SOME LOCAL FACILITIES?

A. I have referred to certain operational problems that must be overcome before any consideration of the economics of UNE-L based service to mass market customers by any CLEC can take place, and these issues are discussed in detail in the testimonies of Mark Stacy and Cedric Cox. These include rapid and seamless cutovers from ILECs to CLECs and from CLECs to CLECs, the nondiscriminatory availability and efficient provisioning of the unbundled elements that the ILECs are still required to provide at TELRIC-based prices, and the development of robust operations support systems capable of handling large volumes of customer migration.

Perhaps the most crucial factors affecting the economic viability of UNE-L based local service to mass market customers are the level of cost for customer-specific investments and nonrecurring charges and the period of time over which those costs may be recovered. The FCC specifically cited economic impairment resulting from hot cut costs as a concern and requires future hot cut processes to be implemented by the state public utility commissions be more efficient and have lower costs than the processes currently in place.[119] While it is not my intention here to recommend a specific price for rate elements related to hot cuts, I do recommend that the Commission determine hot cut prices based upon the most efficient, least-cost technologies, processes and procedures available in order to effectuate seamless transitions between carriers switches. Moreover, I recommend the Commission consider whether costs incurred by ILECs in performing hot cuts are most appropriately recovered through nonrecurring charges, or whether some

other rate structure would reduce the likelihood of impairment. The Commission could, for example, contemplate the development of a competitively neutral cost recovery mechanism whereby the costs of implementing loop portability sufficient to eliminate impairment can be spread across all participants who may benefit from such portability, perhaps in a manner similar to equal access or LNP cost recovery mechanisms.

VI. CONCLUSION

Q. WOULD YOU PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS?

A. Yes. First, I have shown that the geographic area served by the ILEC wire center is the most appropriate definition of the relevant market, both for purpose of the actual deployment "triggers" analysis and for the purpose of analyzing potential deployment of CLEC switching facilities in the absence of UNE-P. While economic theory alone would compel a market definition at the level of the individual customer location, administrative practicality as well as the nature of CLEC deployment decisions strongly indicate the wire center as the appropriate level of analysis, rather than some larger aggregation of wire centers such as the exchange, the metropolitan statistical area, the LATA, or the UNE rate zone. CLECs may decide to offer local exchange service in a larger market area, but whether individual customers will actually have a choice among competitive carriers depends upon the economic characteristics of the wire center in which each is located. That local exchange service can profitably be offered in one wire center is not proof that the same service can be located in nearby wire centers – CLECs will not choose to offer services in those wire centers that will reduce profitability.

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[119] *See, e.g., Triennial Review Order* ¶ 473

Second, I have stated my preliminary conclusion that I have not identified any wire centers in Qwest's territory where the trigger test has been satisfied.

Third, I have discussed the analysis necessary to evaluate economic barriers faced by a CLEC entering the mass-market using UNE-L. Any analysis of the profitability of CLEC local exchange service in the absence of UNE-P must make a number of assumptions regarding the situation that the CLEC will face. Market share and customer "churn" may be highly dependent upon the marketing activities and "winback" programs undertaken by the incumbent LEC (and by other CLECs). Average revenue per customer likewise will depend upon the aggressiveness of the incumbent in cutting prices and upon the discount that the CLEC must offer to attract new customers. The external and internal costs of migrating customers from UNE-P to UNE-L service are only partially under the control of the CLEC, and any systemic problems in implementing hot cuts may affect churn, market share and average revenue.

Each of these factors is crucial in determining the profitability of CLEC UNE-L based local exchange service. Each is, to a greater or lesser extent, interdependent with the other factors. And each is only partially under the control of the CLEC.

Fourth, I have offered recommendations regarding the evaluation of uncertain model results for the purpose of the Commission's deliberations regarding impairment. As I explained at the beginning of this testimony, the consequences of an erroneous finding of non-impairment are serious and irreversible. The consequences of an erroneous finding of impairment are minor and largely will be self-correcting. In view of the uncertainty surrounding any analysis of the potential deployment of CLEC UNE-L based local exchange service, I believe the Commission must impose a very heavy burden on

any evidence that would overturn the FCC's finding of CLEC impairment in the absence of access to unbundled switching.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.